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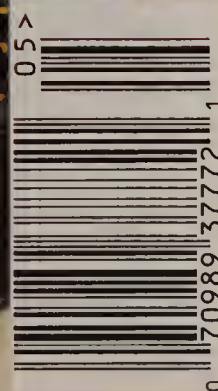
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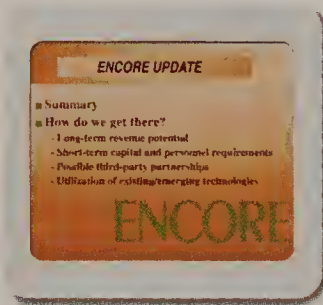
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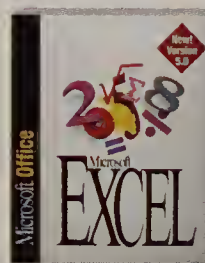
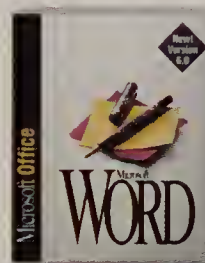
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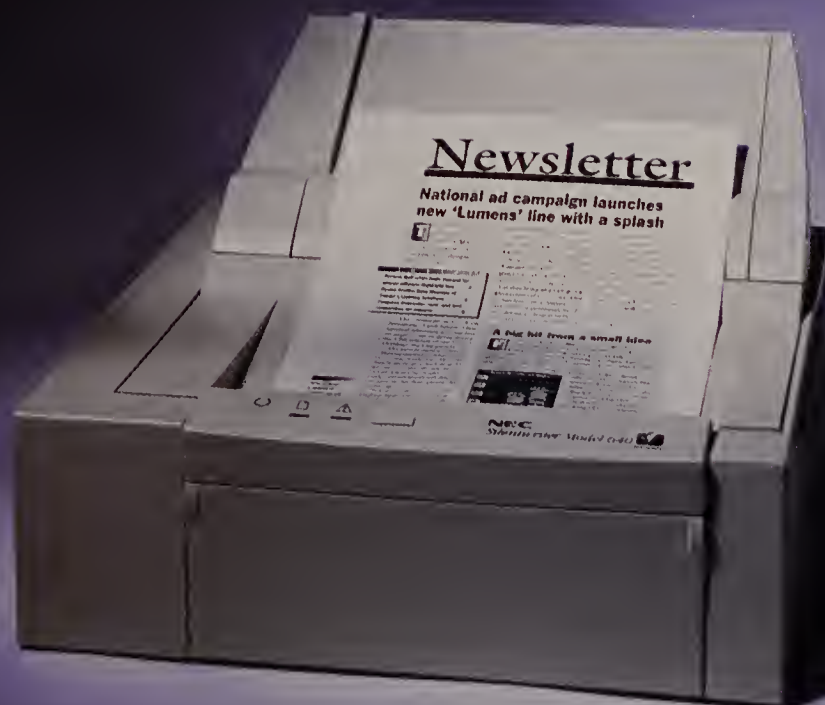
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
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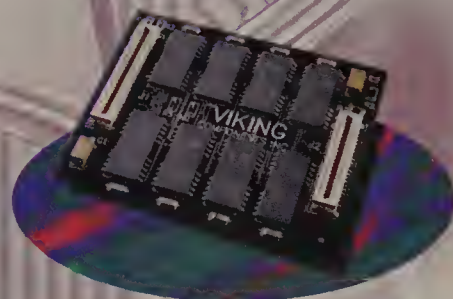
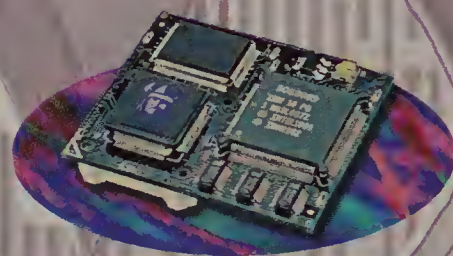
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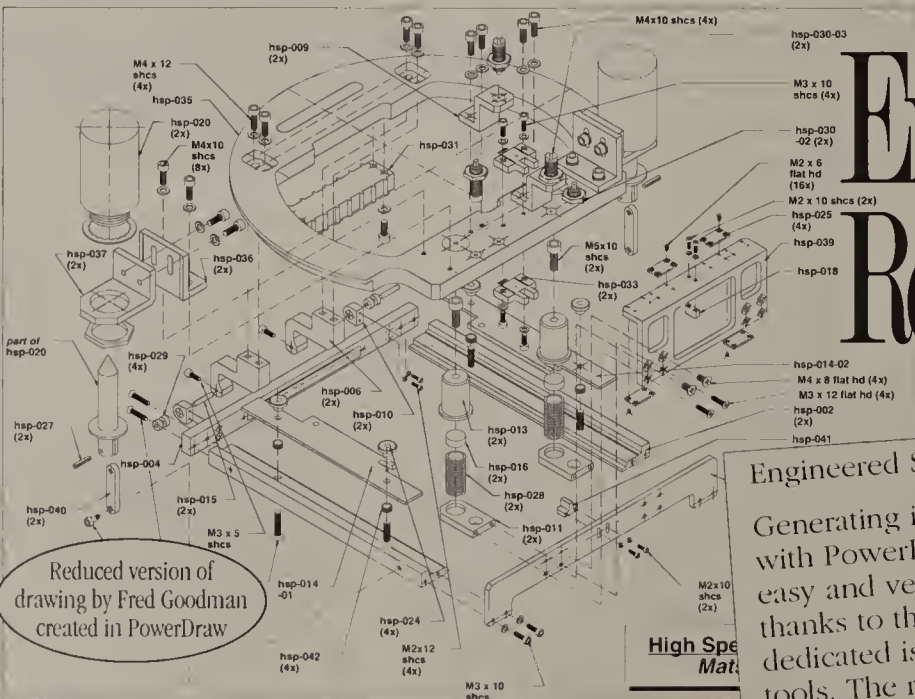
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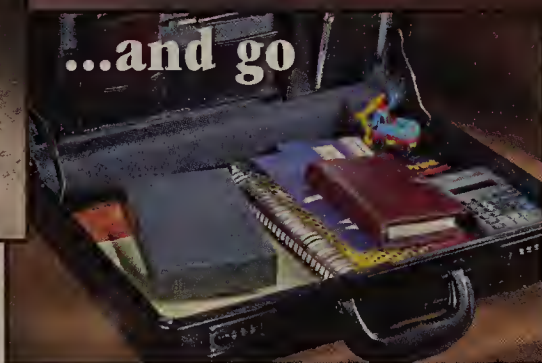
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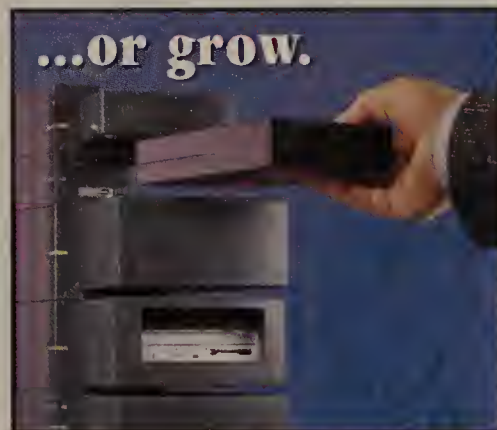


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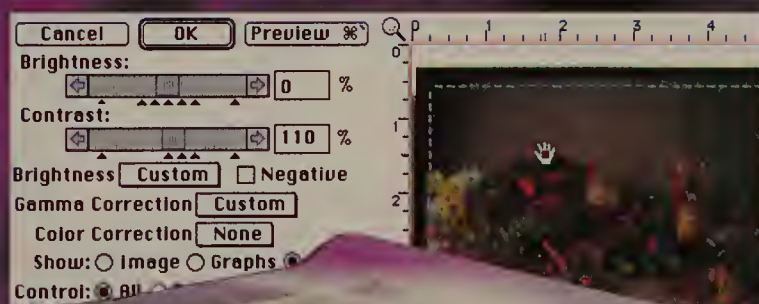
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The Clone Balancing Act

How Apple must weigh market growth and competition

LAST NIGHT I DREAMT THAT I was the all-in-one Macintosh. As I glided into a large hall covered with mirrors, my smiling Mac face was reflected countless times. Gazing deep into this infinity of Macs, I was surprised to notice one Mac moving independently of all the others. But I was bowled over when this reflection threw me a question: "Why are you here?" In shock, I replied, "I am the Mac, who are you?" My doppelgänger answered, "Oh, I'm a Mac, too." "That's impossible," I said, "there is only one true Macintosh, and that's me." An impudent snicker was followed by a long pause. "Not anymore. There are others now." The other reflections began to stir one by one. Then I noticed that they didn't look like any Mac I'd ever seen. The room started spinning and I became dizzy.

The Mac is having an identity crisis. What *is* a Mac now that virtual Macs are coming out of the woodwork under clone makers' brands? Even though most industry observers have lobbied for years for Apple to license the Mac, it's still strange to see Macs coming from companies other than Apple. Technically speaking, they *won't* be Macs because Apple will not permit licensees to call their products Macintoshes (although they can claim to run the Macintosh Operating System). With its recent attempts to solve the problem of market share, Apple has gained a new problem: it will have to manage the delicate balance between its two completely new roles—namely, system software provider to third parties and systems hardware competitor with the same parties. Last month I looked at the opportunities and challenges for clone makers. This month I examine the challenges facing Apple.

Opening Pandora's Mac

Apple has always guarded the Mac as if it were Pandora's box—to open it up might unleash all manner of misery. Apple was reluctant to open the Mac for cards and peripherals until a few years after its introduction, and Apple took more than

ten years before deciding to license the Mac operating system. Apple execs knew that despite all the potential advantages of licensing Mac clones, there were also pitfalls. There are two obvious threats. First, although clones may grow the Mac's market share, some clone sales might come at Apple's expense. Second, clones make it harder to shape the future of the Mac because different companies may offer unique technology variations that Apple as the system software vendor will have to support.

Clones and Competition

Opening up to clones is a high-stakes game that will require Apple to manage complex new licensing relationships with finesse. Apple must start by treating its licensees like customers; after all, clone

also potential competitors. By relying on its highly recognized company and product brands, Apple should continue to sell its own systems and succeed in its established markets. Apple will continue to sell strongly in the consumer and education markets. It will also have to create a new strategy for succeeding in business markets, which presents two immense challenges: sending a clear marketing message and targeting the right markets.

The Market Is the Message In the past ten years or so, while the Mac was competing only with DOS and Windows PCs, Apple had trouble creating a meaningful marketing message. Apple's inability to articulate the unique strengths of the Mac vis-à-vis the other platform has been a source of frustration to many observers (see *The Iconoclast*, in this issue).

Only in the last couple of years has Apple started clearly marketing the Mac's strengths in ways that point out the benefits to users—and only sporadically at that. Now Apple has a much more complex challenge: it must continue to promote the advantages of the entire Mac platform, but it must also persuade hardware customers that Macs from Apple offer unique benefits—all without sowing seeds of doubt about the compatibility and worthiness of Mac clones.

Targeting Markets Beyond creating the message,

Apple must be careful about when it chooses to compete directly with clones. When clones pioneer new concepts, Apple must not go after the same business opportunity without first weighing the cost to its partners/competitors. Apple has a well-known tendency to cannibalize concepts and markets created by its third-party developers. Cannibalization would be a dangerous tactic with clone vendors, who must make major investments in development, marketing, and distribution

continues



makers will be paying money to license the Macintosh Operating System. Some traditionalists within Apple may be inclined to view clone vendors as free-loaders who don't rightly deserve to develop products based on Apple's crown jewels. This would be a dreadful mistake; Apple can ill afford to treat business partners with contempt. The Mac's long-term health depends on the coveted new market share that Apple's licensees will likely provide.

At the same time clone vendors are

to succeed. Should Apple attack markets and concepts being pioneered by its licensees, the chilling effect on the growth of clones in the Mac market could ultimately defeat the purpose of licensing the OS in the first place. Still, Apple must pursue its legitimate business interests as a computer maker in the Mac market. This tightrope act will require an amazing amount of dexterity. And Apple must start identifying areas in the Mac market where it will focus its attention.

Avoiding Technological Anarchy

The second and greatest threat to the Mac market as clones multiply will be the potential for confusion on standards and compatibility. Apple must lead the technological direction of the platform and ensure that Mac-compatibles are indeed a cohesive platform. The Mac platform has always enjoyed relative simplicity when compared with PCs. Although Apple has occasionally created unnecessary complexity in its bus and memory

configurations, there has been nothing like the variety of hardware "standards" and confusion in the PC market. It would be a shame if Macintosh customers had to worry about compatibility with sundry hardware and software options.

There is reason for hope. Because Apple is actively licensing the Mac OS, it has much more influence than IBM did when clones appeared in the PC market. Even so, challenges are inevitable. To address customer needs and give their computers unique strengths, clone makers will want to introduce new technologies and solutions. If not supported by Apple, these new technologies might create a divergence that could lead to competing Mac standards. To meet this challenge Apple must find a new leadership model to support innovation but avoid useless complexity. For example, Apple's system software group and the company's various computer product groups will have to develop a protocol for working together to best serve the interests of the Mac platform as a whole. Apple must also be more careful about introducing technologies: it must avoid promoting new technologies that developers don't support, but it must know when to persevere with technology initiatives that are strategic—even when the clone vendors resist them.

As far as Apple has come in the past few years in transforming itself to meet market challenges, it must go farther. Nothing points this out more clearly than clones. It all boils down to managing Apple in a much more sophisticated way to deal with the new complexities that Macintosh clones create. Apple has at long last become a brilliant tactician, producing elegant systems at appealing prices; it must now continue to evolve and become the strategic architect of its destiny.

The Iconoclast's Farewell

This issue marks the departure of *The Iconoclast* from the pages of *Macworld*. We bid farewell to Steven Levy's monthly column after nearly ten years. Steven has followed the Mac since its introduction and remains a steadfast advocate of the Mac's excellence. Steven is moving to *Newsweek*, where we're sure he'll continue as a thoughtful observer of technology and what it means to ordinary people. Although we are retiring *The Iconoclast* column, we aren't retiring Steven, as he continues to maintain his relationship with *Macworld*. From time to time his writing will resurface in these pages to provide the same insightful and humorous commentary our readers have enjoyed for nearly a decade. **m**

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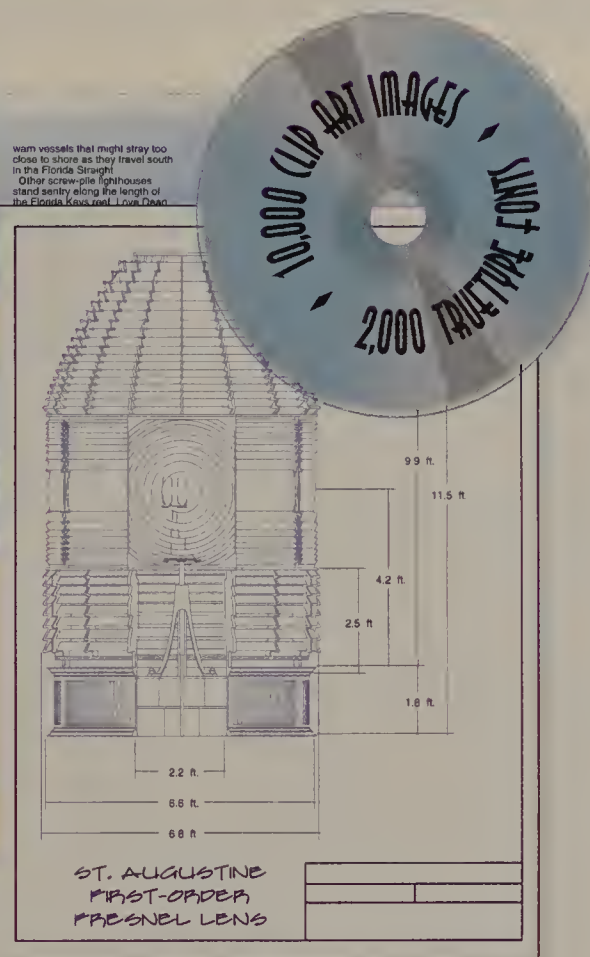
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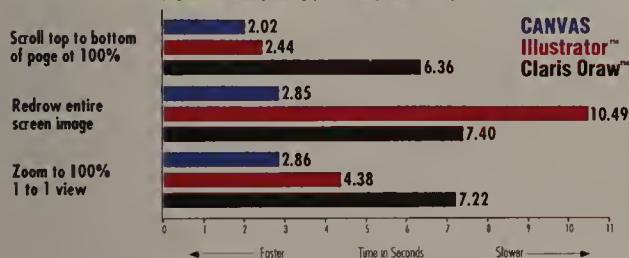


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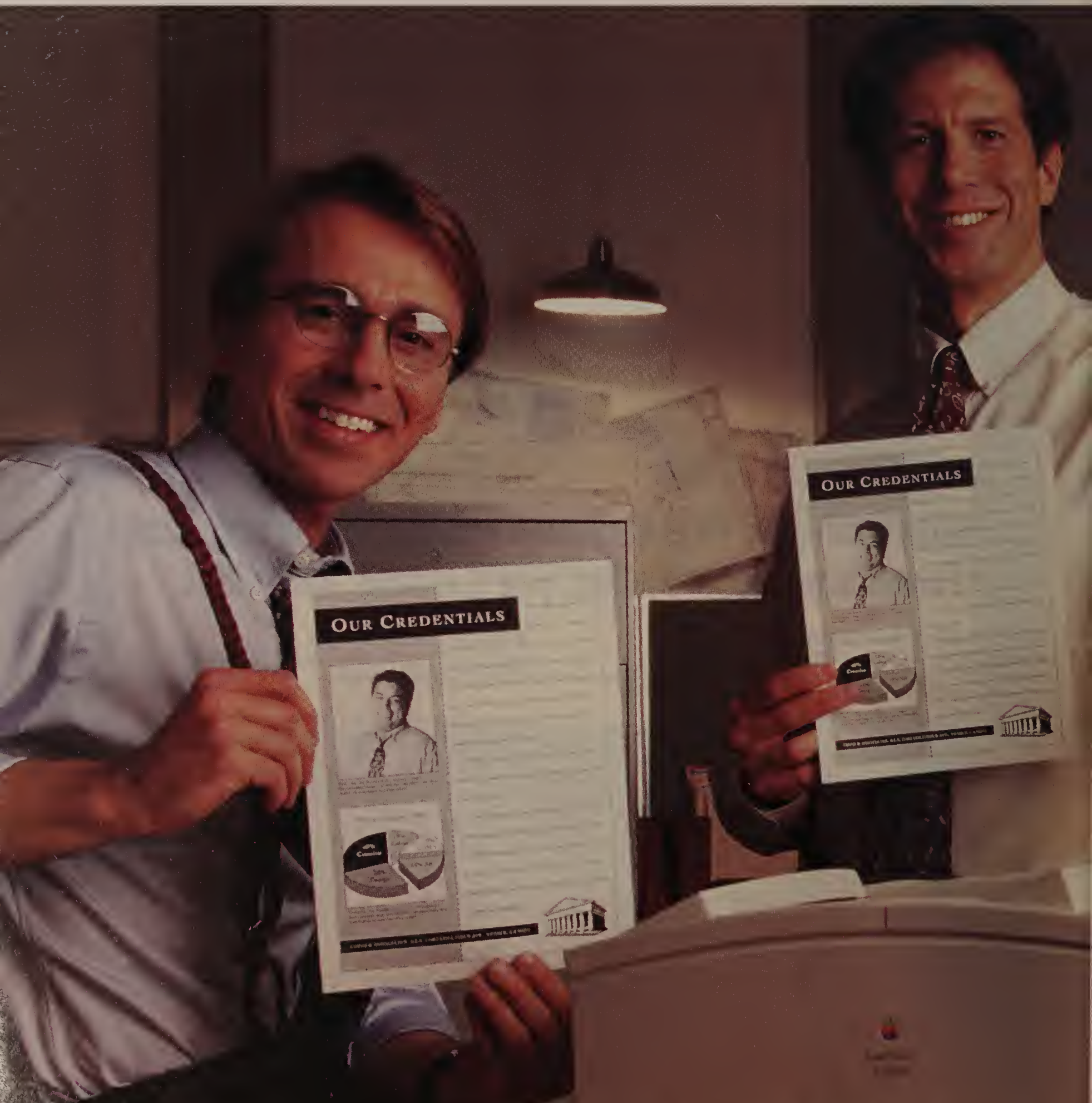
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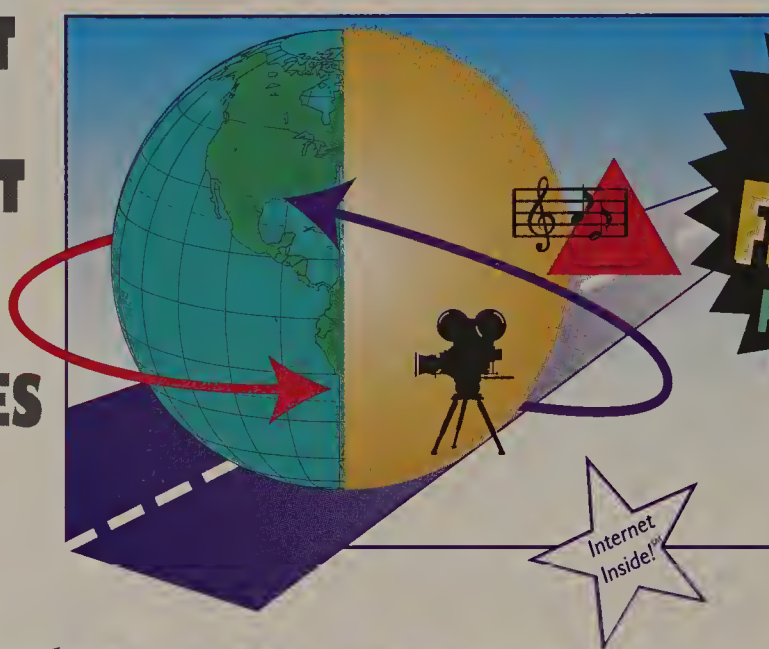
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Circle 95 on reader service card

M A Y 1 9 9 5

Letters

We Don't Do Windows 95

MACWORLD'S ARTICLE "THE NEW Windows Threat," by Galen Gruman (February 1995), could not have been written better by Bill Gates himself. After reading that article, if I were a first-time computer buyer thinking about Mac versus PC I would definitely purchase Windows/Pentium. You have done to me, a dedicated Mac user, what I thought no one could: make me (almost) feel like I made a mistake buying a Mac.

*John Paul DuBois
Tulsa, Oklahoma*

JUST FINISHED READING "THE NEW Windows Threat" in the February *Macworld*. Mr. Gruman mentioned that Windows has pushed ahead, while "the Mac interface of today bears a very strong resemblance to that of a decade ago." Maybe the Mac OS was just done correctly from the beginning.

*Kieran Chapman
South Attleboro, Massachusetts*

IHAVE NEVER BEEN STRUCK BY FEAR while reading an issue of *Macworld* until now. OK, so the new Windows platform is tough to beat; I have enough confidence in Apple keeping the edge in operating systems. But then you hit me with another article that tells me that a Pentium is now faster than a Power Mac in many instances. Please give me hope—I'm ready to run for the hills.

*Todd Horning
Paoli, Pennsylvania*

Don't give up the ship just yet—the Pentium we tested was faster than a Power Mac 8100/110 in only half of our real-world tests. As both platforms continue to mature, performance should seesaw back and forth between the Power Mac and Pentium. In fact, the first Pentiums were slower than the first Power Macs, as we reported in our May 1994 issue (see "The Power Macintosh Arrives"). We're expecting the next generation of Power Macs, due this summer, to reclaim the performance title.—Ed.



Encrypto De Facto

HOW COULD STEVEN LEVY WRITE A column about digital signatures and public-key encryption (*The Iconoclast*, February 1995) and fail to mention Phil Zimmermann's PGP? PGP is by far the most widely used encryption program and the de facto standard on the Internet. Readers (within the United States only, thanks to the silly export laws) with Internet access can obtain PGP 2.6.2, including the Macintosh-specific MacPGP, by telnetting to net-dist.mit.edu, using anonymous FTP and following the instructions. It's also available from CompuServe (Go NCSA) and a number of other sources.

*Mark G. Scheuern
Auburn Hills, Michigan*

In Defense of Clarus

I'M WRITING IN DEFENSE OF CLARUS Systems Group's product, which was panned in the February 1995 *Conspicuous Consumer* column.

As someone with extreme sensitivity to EMF fields, I can vouch for the effectiveness of Clarus's product. I don't know the science behind it, but I do know it greatly reduced the symptoms of headache, vertigo, nausea, and fatigue that I suffered.

Clarus cites studies showing both a reduction of perceived stress in subjects and a reduction in the intensity of EMF fields, which the company will provide if requested.

I don't know who the "expert" was that Deborah Branscum consulted, but considering the hostility in the industry to even the notion of any ill effects from EMF fields, despite mounting evidence from 16 years of serious scientific study, his response was not surprising.

*Randy Perry
Harrisville, Rhode Island*

I consulted with Louis Slesin, who edits and publishes both *Microwave News* and *VDT News*, about the Clarus Systems Group product. Slesin has done a great deal to publicize the potential problems of electromagnetic exposure and has no ax to grind when it comes to related products.—Deborah Branscum

ClarisWorks 3.0

BELIEVE THERE IS A SOLUTION TO THE limitation discussed by Tom Negrino in his review of ClarisWorks 3.0 (*Reviews*, February 1995). Mr. Negrino objects that Claris missed the opportunity to revise the outline feature, so that you could have "an outline and regular text in the same document."

For that portion of the word processing document you wish to outline, draw a text frame within the WP environment by holding down the option key and drawing a frame. You can then select Outline View within this text frame. Only the text within the frame will contain outline format.

*Andrea Posner
Lutz, Florida*

continues

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Circle 299 on reader service card

LETTERS

CORRECTIONS

■ *The correct toll-free number for PictureWorks is 800/304-5400 (New Products, March 1995).*

■ *The PowerPC 601 CPU in Apple's Power Mac upgrade cards does not incorrectly calculate transcendental math functions as implied in "Divide and Flounder" (State of the Mac, March 1995). The less-expensive version of the 601 used in those upgrade cards calculates those functions less speedily than a regular 601. To ensure correct calculations, Apple made the 601's math processor run in a special, but slower, mode.*

■ *The graph for the 80MHz Newer Technology PowerClip ("Making the Move to Power Mac," February 1995) shows the wrong results. Macworld Lab benchmarks show the PowerClip makes the 7100/66 run about 5 percent faster overall, not equal in speed to an unaccelerated 7100/66 as shown, and the PowerClip makes FPU calculations about 7 percent faster, not slower as shown. (Actual times in seconds should be Overall 2.3, CPU 2.3, FPU 3.0, Disk 1.3.)*

■ *An In Brief item in January 1995 News mistakenly said that connect-time to PBS Online would be free. It will be up to participating stations to individually determine pricing for PBS Online.*

Word 6.0

THE FEBRUARY 1995 NEWS ARTICLE "Word 6.0 Performance Disappoints" missed the major point: this is not Word for the Macintosh.

Word 6 does not disappoint, it insults. It slaps every Macintosh owner right in the face as a poor copy of Word for Windows. If I wanted that, I would have bought a DOS machine. But I wanted something better. That is why I bought the Mac in the first place.

Word for the Mac as we knew it is gone. Microsoft has decided that I can no longer have my superior program. I must settle for something less. A great deal less. It is called Word for Windows.

Steven Joseph Fenner
Gahanna, Ohio

IF YOU NEED AT LEAST AN 040 MAC TO run Word 6.0, shouldn't Microsoft have made this clear in their upgrade notices and ads? Supposedly it will now, but this is little consolation to the thousands of unsuspecting and trusting Word users who upgraded to the latest version.

Fred Schreiber
New York, New York

THANK YOU FOR YOUR HELPFUL ARTICLES on Word 6.0 in the February issue. As a student, I would like to underscore the incredible new features, which, in my opinion, more than justify the price to upgrade, which is steep even at academic prices. I would recommend reading through the new features before starting to write any lengthy papers, to maximize saved time. Thanks, Microsoft!

Carl Levinger
Van Nuys, California

Screen-Saver Controversy

IN THE FEBRUARY 1995 DESKTOP CRITIC, David Pogue stated that the engineers he interviewed have told him it is "virtually impossible" for a static image to burn into a color monitor. Really? I don't know what they're teaching in engineering school nowadays, but let me offer some real-world experience. For several years I worked for a company that manufactured touch-screen-operated information kiosks, containing a 14-inch, VGA color monitor. The kiosks were designed to operate 24 hours a day, displaying the company logo on screen until activated by a touch. We found that kiosks returned for service after a few months in the field did indeed show screen burn-in. It was so pronounced that the company logo was obvious on a monitor that was turned off. While it's unlikely that an ordinary user would leave the same screen on for weeks or months, I would guess some phosphor damage may occur at lesser time intervals. At any rate, I would not be so quick to discount screen burn-in as a potential, though unlikely, hazard.

L. Richard Bruursema
Olathe, Kansas

We've all seen PC monitors burned in, and we've all seen older Macintosh monitors burned in. But, as engineers at NEC and Apple told me, modern Macintosh monitors are a different story. I was told that you'd have to leave your monitor on, displaying an unchanging image, for about two years straight before you'd see burn-in.

Furthermore, there's no debate whatever about my real point: the best protection for your screen is not a screen saver, which only continues to bombard the monitor's phosphors. It's blackness. Turn the thing off when you're not using it.—David Pogue

Vistapro 3.0

YOUR REVIEW OF VISTAPRO IN THE February 1995 issue did a great injustice. Vistapro has a patch for some of the problems mentioned, available on continues

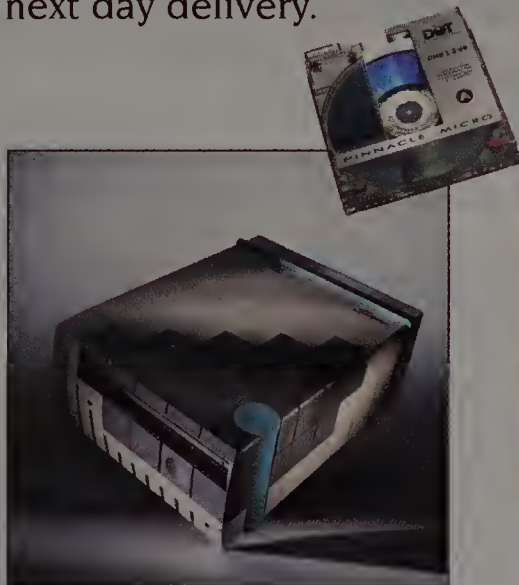
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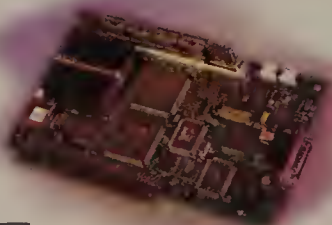
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LETTERS

America Online since September 1994. Vistapro now offers background rendering. If you bought the Vistapro CD, MakePath Flight Director comes with the program. This makes it extremely easy to make the QuickTime movies bank when "flying." It is possible to do this even without MakePath Flight Director, but it is not as easy. Banking movies does not even require the patch, and was included in the previous version.

Last but not least, Vistapro has many levels of tree rendering. There are many different ways to render the trees, and if they are not rendered at the best quality, they might not seem as realistic.

*Aaron Powers
Baldwinsville, New York*

You're right—MakePath Flight Director is included in the CD-ROM version of Vistapro, and background rendering is now a feature. My review was based on the disk version that the company sent for review; it didn't include background rendering.

While you can bank the camera when making animations in Vistapro, to do so you must use the program's scripting language. Scenery Animator, on the other hand, provides a menu command that automatically banks the camera as it "flies" through a landscape.

I did render the various trees at the best quality, and I still found them less realistic than Scenery Animator's trees.—Erfert Fenton

Bravo, Apple

I WAS SORRY TO READ ABOUT MARK Thomas's trials and tribulations in obtaining System 7.5 from Apple (*Letters*, February 1995). I was also struck by the extreme contrast between his negative experience and the delightful situation I encountered.

In November 1994, I purchased from a local dealer a Quadra 630 with System 7.1.2p installed. In early December, I returned to the store, and the sales clerk who sold me the 630 gave me a form he had forgotten to include with my system. It was a special upgrade offer for System 7.5 direct from Apple. Apparently, Apple had since started shipping System 7.5 with the latest Quadra 630s, and wanted to send me System 7.5 for *free* (plus \$10 for shipping and handling) as long as I ordered by the end of the year. Who could refuse such an offer? I wrote a company check on December 15, and the System 7.5 package arrived on December 23. In fact, Apple's System 7.5 Upgrade Office in Buffalo responded so quickly that it shipped the upgrade *before* even cashing my check! It was a wonderful Christmas present.

Certainly, I can sympathize with the

plight of Mr. Thomas and those who share his unfortunate situation. I also recognize that problems can occur with service and support from any company and that Apple is no exception. In my case, however, I can only offer the highest kudos for the service Apple provided to me and my company. Bravo, Apple!

*Alan V. Michaels
Victor, New York*

Obloid Factoid

ALMOST EVERY PIECE OF SOFTWARE now on the market can draw round-cornered rectangles. But gee, that's a mouthful. We can do better. I suggest *obloid* for the following reasons: (1) it's a portmanteau word suggestive of *oblong* and *ovoid*; (2) it has the same number of letters as *square* and *circle*; (3) it isn't being used for anything else; and (4) as far as I can tell, nobody owns it.

*Richard Russell
Madison, Wisconsin*

Where's Our CD-ROM?

IT'S TERRIBLY FRUSTRATING TO GO to the store and see the latest issue of *Macworld* show up with a free CD-ROM included. Is it so difficult to send it to subscribers, too? Why should we renew our subscription at this point?

*John Austin
Spokane, Washington*

The free software seen on newsstand copies is a special promotion designed to sell newsstand copies, which are also sold at three times the price of subscriber copies. Because it is prohibitively expensive to mail out the software with the magazine, we only offer the promotional software on request. Provided that the software is still available, subscribers can receive it by writing directly to *Macworld*. Specify the name of the promotional disk or CD you saw on the newsstand, enclose a check or money order for \$1.50 shipping and handling for each item ordered, payable to *Macworld*, and send to Macworld Newsstand Promotions, 501 Second St., San Francisco, CA 94107.—Ed. **m**

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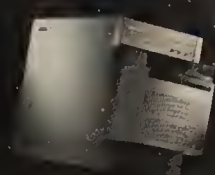
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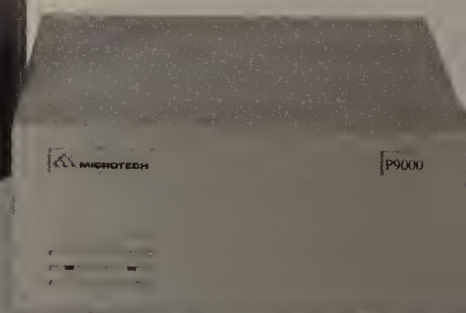
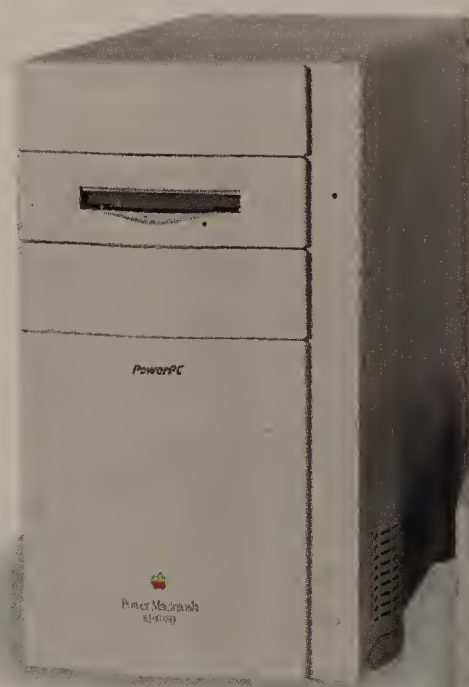
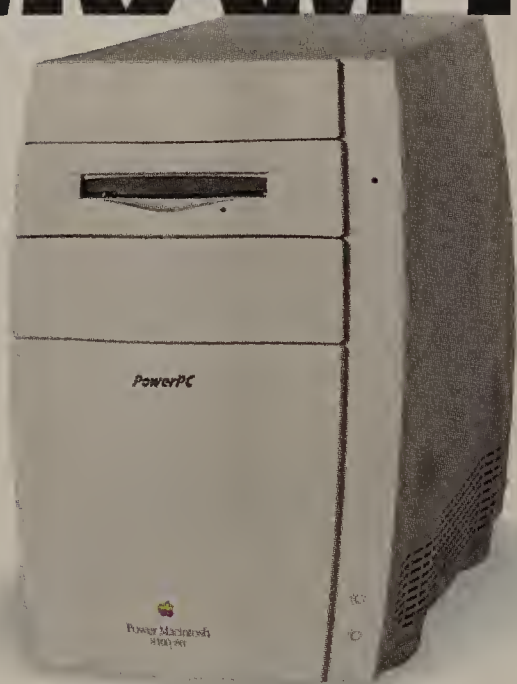


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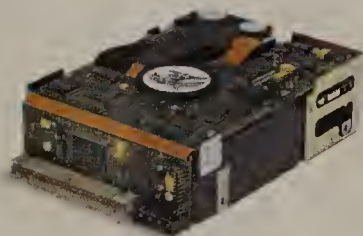
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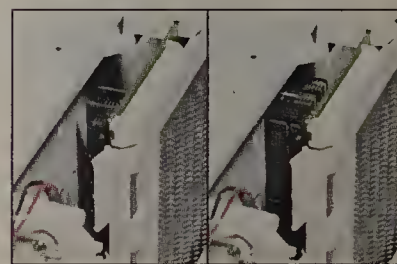


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MacBulletin

◀ **First 604-Based Power Macs Due**

Soon Apple plans to ship the first PowerPC 604-based Power Macs in midyear, according to Steve Manser, Apple's vice president in charge of desktop systems. That's the same time frame Apple has announced for the first Power Macs that use the PCI bus instead of NuBus. For more details on the 604, see "The 604 Advantage," *Power Mac News*, in this issue.

Up to Nine New Clone Makers Expected This Year

Apple expects another three to nine clone makers to ship licensed Mac clones this year, according to Mary Ann Cusenza, Apple's treasurer. Apple will not reveal who the likely clone makers are, although it says it has signed up new Mac OS licensees. For more details on the three announced clone makers, see "Pioneer Unveils AV Mac Clones," *News*, in this issue, and the feature article "First Clones" in the April 1995 issue.

MacInTax Troubles The 1994 edition of Intuit's MacInTax can produce errors if you import financial data from other software, or if you meet one or more of the following conditions: (1) you only have disability income, (2) you are taking a Section 179 deduction for an automobile, (3) you are working with the Estimated Tax Worksheet to estimate payments for the 1995 tax year, or (4) you are depreciating an asset that is in the final year of its depreciable life. Intuit has released a bug-fix. 602/295-3080.

Apple, Microsoft Clash over Video

Apple has added Microsoft and Intel to a lawsuit it filed last December against San Francisco Canyon, a company Apple had contracted to develop QuickTime for Windows. Apple claims that thousands of lines of code developed for Apple's QuickTime turned up in a program Canyon designed for Intel to accelerate Microsoft's QuickTime competitor, Video for Windows 1.1d—

code that Apple says Intel then provided to Microsoft for use in more than 20 Microsoft products. Apple says that an independent source verified the replication of the QuickTime code. In early March a federal court ordered Microsoft to stop distributing Video for Windows files that contained the contested code, via bulletin boards and CD-ROM. Other companies distributing the files are unaffected.

Live Picture's Price Plummets Citing a desire to make its image processing program more accessible, HSC Software has cut the retail price of Live Picture by 75 percent—from \$3995 to \$995. The price is now competitive with those of other image editors, such as Adobe Photoshop (\$895), Fauve Software's xRes (\$799), and QuarkXPosure (\$895, due out this summer; see *Graphics* news, in this issue). What consolation will be offered to those who already paid the original price? HSC says that anyone who purchased on or after November 27, 1994, can attend a free, two-day hands-on training session tentatively scheduled for this spring in Santa Barbara, California. All registered users will receive a free upgrade to version 2.0 (due to ship by March).

AppleTalk Gains Multimedia Support

To optimize the exchange of real-time multimedia over local- and wide-area networks, Apple has developed AppleTalk Multicast extensions and related protocols that deliver multimedia data over a network to just the nodes that request the information. The AppleTalk extension means that workgroups won't have to migrate to Ethernet to enjoy the benefits of the cross-platform QuickTime videoconferencing products expected by summer 1995 that support the H.320 worldwide teleconferencing standard. Apple is licensing the multicast protocols; internetworking-equipment vendor Cisco Systems (408/526-4000) has already signed on. **m**

News

EDITED BY TOM MORAN

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The QuickDraw 3D Revolution

Before Apple devised the QuickTime standard, trying to work with audio or video on a personal computer could turn into a real mess. Now that QuickTime is widely used on the Mac and on Windows machines, Apple is attempting a similar achievement with QuickDraw 3D: creating a standard way of dealing with 3-D images—from creation to output. One of the most exciting possible uses for the QD 3D software developers' kit that Apple hopes to ship soon might already be in the labs at Apple: a 3-D Macintosh interface. Although company representatives have declined to confirm that QuickDraw 3D would be used to create a 3-D version of the Macintosh Finder (among other things), Apple documents note that the company's strategy is to "make 3D interaction an integral part of the Macintosh experience," and Apple has shown a 3-D interface for manipulating objects within applications.

QuickDraw 3D will take advantage of the processing power of Power Macs (no 680X0 version is anticipated) to bring 3-D from high-end workstations to the high-volume personal computer arena.



ROB MAGIERA

Although 3-D graphics software programs already exist for the Mac, professional 3-D images and animations are more often developed on powerful technical workstations, such as those from Silicon Graphics. Since PowerPC chips have brought greater processing power to the Macintosh desktop systems, it's now much more possible and

useful for Apple to create a platform for creating and managing 3-D projects.

3-D Cut-and-Paste

The new 3-D standard will allow for cut and paste across the Mac and Windows platforms, according to John Alfano, Apple's 3-D architectures product manager. Currently, 3-D applications often

have their own custom formats, meaning that a lot of exporting and converting is required when manipulating files, especially across platforms. But if Apple's metafile format for 3-D images is widely accepted, users will not have to worry as much about importing or converting files to work with their 3-D applications. "Our goal is to make 3-D

just as ubiquitous as PICT or type," Alfano says. Apple expects QuickDraw 3D to have its biggest impact in design engineering, publishing, digital video, education, and entertainment. One intriguing possibility for education or games is that Apple might find a way to combine QuickTime VR (for virtual reality) with QuickDraw 3D. "We have had discussions with the QuickTime VR team about the next steps for integration, and I think we might cook up some interesting things," Alfano says.

An interesting feature of a QuickDraw 3D metafile is that it is not a prerendered bitmap but more of a database of data and operations that carry out the rendering on the computer opening the file, something like what EPS does for two-dimensional files. While cautioning that there is no such thing as a typical 3-D file, Alfano says that an example file showing a fully shaded car (about 3180 polygons) takes up only about 182K. The metafile includes the basic geometry and a database with all the information required to render and light the image. Also, QuickDraw 3D is designed as an extensible architecture: like QuickTime, it will accept plug-in modules designed by third parties. The second version of QuickDraw 3D will accept third-party rendering modules and shading modules: Apple says the first version of QD 3D will not have this capability completely activated because of the need for further testing.

QuickDraw 3D for Windows

Apple says it has already seeded about 200 developers with alpha versions of the software developers' kit. The company plans to ship the end-user version of QuickDraw 3D 1.0 this summer for the Mac, with a Windows version following about six months later. The Mac version will ship with new Macintoshes, will be licensed to developers, and will be rolled into the next system software update.

continues on page 38

Pioneer Unveils AV Mac Clones

In a move that represents the first foray by Macintosh clone makers into the home/entertainment market, Pioneer Electronics Corporation announced February 15 that it will begin selling clones bundled with Pioneer-brand peripherals this summer. Initially the clones will be available only in Japan. Pioneer spokeswoman Joni Saphir said that the company has not yet decided if it will offer machines in the U.S. market.

Pioneer, which has not previously built or marketed computer systems, is known primarily for its consumer AV equipment; in the Mac market, Pioneer is also a leading supplier of CD-ROM, magneto-optical, and laser-disc drives.

Pioneer plans to sell high-end and low-end models—the Personal Computer MPC-GX1 will be based on a 66MHz PowerPC 601 processor, the same as used with the Power Macintosh 7100/66. The low-end MPC-LX100 machine will use a 33MHz 68LC040 processor—a chip that lacks a floating-point unit and provides performance inferior to that of currently shipping Apple desktop units except some Performa models—which should be adequate for most home/entertainment needs.

Both machines will ship with quad-speed CD-ROM drives, multiscan displays, and CLD players, described by Pioneer as external drives that play both audio CDs and laser discs. CLDs either provide dual trays for the different-size disks or use a single laser disc-size tray with an inner slot for CDs, much as turntables designed for LP records could also hold old 45-rpm records.

Pioneer's machines will be the first clones specifically targeted to home users, which may explain the emphasis on the Japanese market. Apple Macs are relatively strong in

the U.S. home market, and a clone maker might have difficulty competing here. Apple hopes clone vendors will enhance the Macintosh OS presence in Japan over the next couple of years.

The Pioneer license covers only KanjiTalk (Apple's Japanese operating system), effectively restricting the company to the Japanese market for now. One target market Apple covets for the Mac OS is Japanese education, where Apple holds a relatively small market share compared with its preeminent position in U.S. education. The machines Pioneer is developing would be logical candidates for education, but Saphir says that Pioneer currently has no plans to market its clones to schools.—CHARLES PILLER



A Rush to the Web

COMMERCE ON THE INTERNET

Establishing a connection to the World Wide Web can be time-consuming, expensive, and fraught with crashes. Online services are rushing to change all that by expanding their Internet offerings, and at the same time they're cutting prices to compete for customers.

America Online expects to *continues*

Apple's Appeal Rejected

The U.S. Supreme Court has rejected Apple's petition asking for a review of the company's long-running lawsuit against Microsoft and Hewlett-Packard. The lawsuit alleged that Microsoft and HP violated Apple copyrights on elements of the Macintosh interface. The rejection lets stand earlier judgments that ruled against Apple.

SyQuest Drops Prices

SyQuest Technology has dropped the prices of the 44MB, 88MB, and 200MB removable cartridges for its 5¼-inch drives by about 30 percent. The company cited higher volumes and reduced manufacturing costs as reasons for the move. 510/226-4000.

QuickTime VR Going to Developers

QuickTime VR, Apple's hot-buzz technology that puts the user inside a navigable space (the bridge of the *Enterprise*, for instance), should begin shipping to developers in March. QuickTime VR is designed so that environments that developers build on the Mac can play either on Macs or on Windows machines. Products designed for the end user to experience should begin appearing three to six months after the developer version ships.

Multi SCSI for PCI Bus

Atto Technology says it has designed a Fast/Wide SCSI-2 accelerator board that fits into PCI slots and that it is shipping the board to OEMs and system integrators. PCI is the bus that Apple will use on the next generation of Power Macs. Atto says its card can sustain SCSI data transfers of up to 40MB per second. The ExpressPCI card supports 30 SCSI bus IDs and provides full support for RAID levels 0, 1, 5, and 10 on both internal and external drives. The ExpressPCI supports SCSI Manager 4.3. 716/691-1999.

have a Mac Web browser in the first half of the year. AOL says its browser technology will include multithreading, persistent caching, and full access to Internet features, including E-mail, Gopher, WAIS, and FTP.

CompuServe, Prodigy, Delphi, and eWorld say they expect to add Mac-compatible Web browsers sometime in 1995. CompuServe will first build a browser into its CompuServe Information Manager. Later it will offer a service called Dial PPP for members who want to access the Internet and the Web through CompuServe but using their own browser program.

Prodigy's Mac browser will be available sometime in the second half of the year, at the same time Prodigy releases an "honest-to-God" Macintosh interface, according to the company. (A Windows-based browser and Web access became available in January at no extra charge.)

Even Microsoft, which is creating an upcoming online service called Microsoft Network, plans to offer full Internet capability to Macintosh users—eventually. "The Mac is a target platform for us," according to Anthony Bay, Microsoft director of Internet and corporate services. "We fully intend to do a Macintosh client." Mac fans shouldn't expect one in 1995, however.

At least initially, some of the browsers offered by online services won't have the full capabilities of software such as Mosaic and Netscape. One consolation may be the price, however. Few services have set a price for Web access, but standard access is now cheaper. AOL's \$9.95 monthly fee for five hours continues; additional hours now cost \$2.95 each instead of \$3.50. CompuServe's standard plan is \$9.95 per month; premium services at 9.6 Kbps and 14.4 Kbps are now \$4.80 per hour instead of \$8.60. eWorld members get four hours per month instead of two for \$8.95; additional hours are \$2.95 each, not \$4.95.—DEBORAH BRANSCUM

Internet in the OS

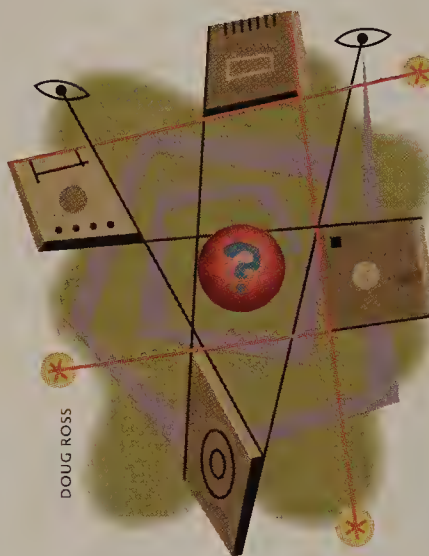
APPLE'S
HIDDEN ADVANTAGES

The race to bring Internet services directly into the operating system is on. And while other companies have done a better job at trumpeting their plans, Apple has been quietly putting the pieces in place. In the fall of 1994, IBM began the public race to include Internet services in the operating system by touting those features in OS/2 Warp. Currently shipping, Warp includes TCP/IP protocol stacks, Internet utilities (Gopher, FTP, Telnet, and World Wide Web), and E-mail. At a single click, the system will establish a SLIP connection with IBM's Global Network, where users can sign up for an account and receive ten hours of free connect time.

In early 1995, Microsoft painted basically the same picture in broader strokes. Bill Gates announced that Windows 95 users would have one-click access to Microsoft Network and that, through relationships with UUNet and Spyglass, Microsoft would be bringing the Internet to Microsoft Network.

Although it has not made a comprehensive announcement concerning Internet services in the Macintosh Operating System, Apple does hold the advantage of having many of the pieces in place. PowerTalk already gives System 7.X users integrated E-mail, and Apple ships MacTCP as part of System 7.5. In 1995, users can expect integrated online access in PowerTalk; Apple's Open Transport Communications Architecture will put TCP/IP networking protocols deeper in the heart of the operating system. Recently, Apple told *Macworld* that more Internet services, some developed by third parties, would find their way into the OS in 1995 and 1996. According to Garry

Hornbuckle, product line manager, networking and communications products at Apple, "While we've made a start with MacTCP in the OS, that's by no means our idea of where to quit. We have a lot more steps planned, with the goal of making the Macintosh a great [Internet] client out of the box."—CAMERON CROTTY



Optical Chaos

FOUR STANDARDS COMPETE

Four new, incompatible erasable optical disk drive formats will appear in the coming months. Each claims a special feature lacking in the competition. All have storage in the 640MB to 650MB range and will sell for roughly \$700 to \$1000. Three of the drives will use 3.5-inch media and will come in versions

small enough to fit in a floppy drive bay. Sony will be out with a 650MB magneto-optical (MO) SSD drive this summer that is incompatible with its own earlier ISO 3.5-inch optical drives. The ISO group—including Fujitsu, Olympus, Ricoh, Epson, and many others—builds on the existing 3.5-inch MO format. The new ISO 640MB drive, due in early 1996, will read and write to older 230MB disks and will read but not write to 128MB disks. Toshiba has announced a 650MB-per-side phase-change format that it will introduce as a two-sided 1.3GB disk. Panasonic's physically larger PD drive, promised in early 1995, can read standard 4.77-inch CD-ROM discs (quad-speed) as well as read and write a new phase-change format. Phase-change format disks cannot be read by ordinary CD-ROM drives.

Sony claims that giving up compatibility with existing MO cartridges yields higher performance and storage density; the ISO group says it will add all the same advantages in future versions and still maintain at least read compatibility. Toshiba points to its high capacity and promises a fast data-transfer rate (16.4 Mbps) immediately. Panasonic says its dual-use drive will save space and costs in desktop computers, offsetting its slow-

THE AMCoEX INDEX OF USED MACINTOSH PRICES

Machine/RAM/Hard Drive	Average Sale Price	Monthly Change
PowerBook 100/4MB/20MB	\$450	-\$50
PowerBook 140/4MB/40MB	\$650	-\$50
PowerBook 180/4MB/80MB	\$1550	\$0
PowerBook Duo 230/4MB/80MB	\$825	+\$25
Mac Classic/2MB/40MB	\$350	+\$25
Mac SE/30/2MB/40MB	\$500	-\$25
Mac LC II/4MB/40MB	\$425	-\$25
Mac IIsi/3MB/40MB	\$425	-\$25
Mac IIci/4MB/80MB	\$625	-\$25
Mac IIfx/4MB/80MB	\$750	-\$50
Centris 650/8MB/230MB	\$1250	-\$125
Quadra 900/8MB/160MB	\$1900	-\$100

Index provided by the American Computer Exchange of Atlanta (800/786-0717). It reflects sales during week of February 20. Configurations include keyboard and exclude monitor and display board for noncompact models.

er performance. The vendors say that the 640MB and 650MB formats will be expanded to 1.3GB; all versions may eventually reach 2.6GB. To achieve such capacity, some disks would be two sided; since these small drives would have space for only one laser head, you would have to turn the disk over, making each side a distinct volume.

No one expects all four of the formats to survive, but each format has backing from at least one very large company that claims it will establish an industry standard. None of the optical formats can offer the performance of a magnetic hard disk, so one beneficiary of the inevitable confusion may be magnetic cartridge maker SyQuest. SyQuest's purely magnetic drives currently outsell all the optical drives combined, according to the *Disk/Trend Report* newsletter.—CARY LU

Newton Branches Out

**HARDWARE LICENSEES
CREATE NEW SOLUTIONS**

If imitation is the sincerest form of flattery, then Apple's Personal Interactive Electronics (PIE) division may be on its way to a swelled head. While not abandoning its original vision of the Newton as a PDA panacea, the PIE group is working on its role as an OEM and technology developer. Given the two Newton-based units that have recently appeared, the efforts appear to be bearing fruit.

Roughly the size of a paperback book, Motorola's Marco is a PDA with the heart of a Newton and the soul of a pager. Like a book or a personal organizer, the black plastic device opens and



The SuperTech 2000 is a ruggedized PDA that uses Apple's Newton technology.

closes on a vertical hinge; on the right is the familiar 320-by-240-pixel MessagePad screen. The left-hand side is blank, but houses a wireless, packet-data radio modem. Support for the radio is built into the Marco's Newton-based operating system; users send and receive mail via Ardis's RadioMail service or Personal Messaging Service. The Marco has 1MB of static RAM, an AppleTalk serial port, a PCMCIA Type II slot, and a Newton infrared beaming port. The Marco uses a rechargeable nickel-cadmium battery pack and runs an enhanced version of the Newton OS. Pricing for the Marco is not set but will range from \$900 to \$1300.

While the Marco is aimed at mobile executives, other companies are developing Newton platforms intended for more vertical markets. The SuperTech 2000, developed by Harris Corporation's Dragon Division and Digital Ocean, looks like what might happen if Fisher-Price designed a PDA. The unit looks roughly like a MessagePad 110, only twice as thick and encased in a hefty removable rubber protective cover that allows the unit to survive a 6-foot drop to concrete. The bulky body houses 1MB of static RAM, an AppleTalk serial port, a rechargeable nickel-metal-hydride battery pack, and a backlit display. The SuperTech 2000 (also sold by Digital Ocean as the Tarpon) contains Digital Ocean's spread-spectrum wireless LAN technology. Harris and Digital Ocean expect the unit

to be used in warehouses, factories, retail stores, or on the road, where the device could connect to a remote server carried in a service technician's tool van. Pricing on the SuperTech 2000/Tarpon is not set but is expected to be approximately \$3000. For more information about the latest Newton advances, see also "Newton Sprouts Again," *At Work* news, March 1995. Digital Ocean, 913/888-3380; Harris, 805/987-9511; Motorola, 800/894-7353.

—CAMERON CROTTY

Microsoft Fixes Word

**SOFTWARE GIANT
BATTLES CRITICISM**

Responding to outraged buyers of Microsoft Word 6 for the Macintosh, who contend that the new version of the word processor is too big and too slow, Microsoft has announced a maintenance release that it says will improve performance. Microsoft says that Word 6.0.1, expected by late March, will speed load times, address printing problems, resolve extension conflicts, and fix speed issues on 030-based machines.

The company will likely relabel the Word 6 package to say "040-recommended," according to Martina Lauchengco, Word for the Mac product manager. "Word runs on 030s, but it runs optimally on 040s," says Lauchengco. "Of course, people's systems vary greatly, so it depends on the system configuration. The better machine you have, the better it'll run. We want to be more open—we don't want people to feel misled."

Microsoft says it would notify registered Word 6 users of the free update via mail. Word 6.0.1 will be available from online services and Microsoft's customer-service department. Microsoft, 800/426-9400; 800/563-9048 in Canada.—JOANNA PEARLSTEIN

Pinnacle Cuts Orray Price

Pinnacle Micro has reduced the list price of its Orray optical array system from \$14,995 to \$9995 (see *News, Macworld*, June 1994). The Orray looks to the Macintosh like a fast hard drive but is actually based on four removable optical drives with a capacity of 5.2GB. 714/727-3300.

4GB Drive, 8GB Array

Conner Peripherals has added to its DiskStor line a 4GB drive that it is offering as an internal or external stand-alone drive, or in pairs as an 8GB disk array. Called the Conner Filepro Performance 4207, the drive has a 9ms access time and a data-transfer rate of 4.1MB per second. The \$2695 internal stand-alone version fits the Quadra 800 and 840 and the Power Macintosh 8100 and 8150. The external single drive lists for \$2795. The 8GB configuration (\$5795) comes as a RAID Level 0 (for greater speed), but can alternatively work as a RAID Level 1 (for greater data security). 408/456-4500.

Samsung Monitors

Samsung Electronics America has announced three monitors: two for consumers and one for graphics professionals. The SyncMaster 15CLi and 17GLi are 15-inch and 17-inch displays, respectively, aimed at the consumer market. They support resolutions of 1280 by 1024 pixels at a 60Hz refresh rate (a refresh rate that some Macintosh users will find too low), and 1024 by 768 pixels at 76Hz. The 15-inch lists for \$560, and the 17-inch lists for \$849. The \$1665 SyncMaster 20GLi, a 20-inch display for graphics professionals, supports resolutions up to 1600 by 1200 at a 60Hz refresh rate. All three of the monitors have a 0.28mm dot pitch and comply with Energy Star and MPR II guidelines. 201/229-4000.

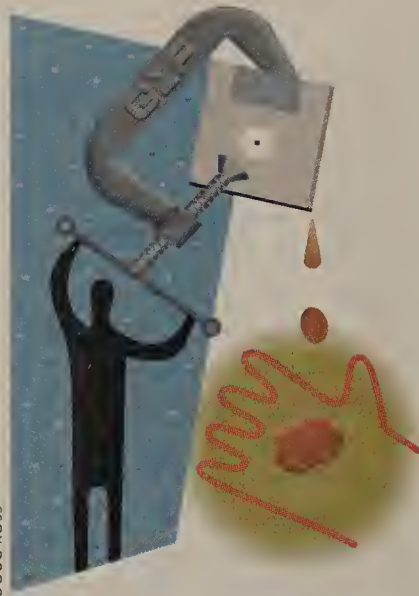
CompuServe GIF Uproar

ON THE MENU:
ROYALTY SURPRISE

It happened just before New Year's Day, but when CompuServe announced that developers would have to pay to have their software read and write the Graphics Interchange Format (GIF), the fireworks would have sufficed for the Fourth of July.

In 1987, CompuServe developed GIF as a free, non-proprietary specification for graphics files. CompuServe incorporated a data-compression algorithm called Lempel Zev Welch (LZW), which, unbeknownst to the company, had been patented in 1985 by Unisys, the large computer technology company based in Blue Bell, Pennsylvania. In 1993, Unisys notified CompuServe that LZW was patented, and the two companies worked out a licensing agreement that calls for CompuServe to pay Unisys a 1 percent royalty on each copy of its software. Part of the agreement was that CompuServe could relicense LZW to other developers creating software that used the GIF specification in connection with CompuServe. When CompuServe announced this in its graphics forum on December 29, 1994, its developer community collectively hit the roof. CompuServe was accused of trying to profit off the sweat of small developers, and Unisys was raked over the coals for betraying the spirit of the Internet, where information is supposedly free to any who ask.

It turns out that it's hard to find malice in this story, only missteps. LZW is a widely used algorithm, appearing in the V.42 data-compression protocol in modems and in the TIFF (tagged-image file format) specification for graphics files. In the years since Unisys patented LZW, many companies have licensed the technol-



DOUG ROSS

ogy, including Adobe, GEnie, Intel, and several modem hardware manufacturers. Since the CompuServe announcement, Unisys has been contacted by many other companies, including "virtually every major online service," according to a Unisys spokesperson. Unisys also appears to be doing its best to keep the algorithm in play, give smaller developers a fair shake, and to acknowledge that it wasn't as public as it could have been

about its patent. The company says it won't require licensing for noncommercial, nonprofit applications, and it won't go after back fees for products marketed prior to 1995. A company spokesperson also characterized expected licensing terms "as not excessively different" from those received by CompuServe.

So far, the only thing that CompuServe is guilty of is not doing its homework thoroughly enough when developing the GIF specification. CompuServe has investigated several ways to alleviate the problem, including purchasing the LZW patent as it applies to GIF from Unisys (at press time, that effort appeared to be dead in the water). Currently, CompuServe is driving the development in the graphics community of a new, 24-bit standard based on publicly available algorithms.

—CAMERON CROTTY

"QUICKDRAW 3D" continued

Support Gathers for QuickDraw 3D

Many vendors of 3-D hardware and software support QuickDraw 3D:

- 3Dlabs is writing QuickDraw 3-D drivers for its GLINT 3-D acceleration chip. 408/436-3455.

- Byte by Byte says a compatible version of its Sculpt ray-trace modeling software will ship when QuickDraw 3D is released. 512/795-0150.

- Diehl Graphsoft's next release of MiniCad will use the metafile, with more support to follow. 410/290-5114.

- EA Research says its line of Easycolor 3-D accelerator boards will work with QuickDraw 3D via a software upgrade. 510/867-0967.

- Electric Image is working on a QD3D version of its ElectricImage Animation System rendering software. 818/577-1627.

- Graphisoft says ArchiCAD supports the QD3D metafile format and will add support for more of the API. 415/737-8665.

- Ray Dream will support QD3D in future versions of its Ray Dream Designer 3-D illustration software. 415/960-0768.

- Spatial Technology is integrating its ACIS geometric modeling tool kit with QD3D. 303/449-0649.

- Specular International will support QD3D in Infini-D 3-D and LogoMotion. 413/253-3100.

- Strata's StudioPro should support QD3D as soon as Apple ships it. 801/628-5218.

- Syndesis says its InterChange 3-D file-translation software for Windows will support the QD3D metafile format. 414/674-5200.

- Vertigo Technology will port its 3-D media authoring software to the Power Macintosh to take advantage of QD3D. 604/684-2108.

- Viewpoint DataLabs says it is offering more than 3000 three-D models that are compatible with QD3D. 801/229-3000.—T.M.

BUGS & TURKEYS



Checking your spelling in the Power Mac version of Persuasion 3.01 can crash your system. Adobe plans a fix in a future version but could not specify a release date at press time. Adobe Systems, 415/961-4400.



If you're using GlobalFax 2.5, be careful what application you open while your serial port is in use. Users report system crashes when launching Microsoft FoxPro if the Mac's serial port is active. Crashes do not occur if FoxPro is already launched when the serial port is activated. Global Village is researching the problem. Global Village, 408/523-1000; Microsoft, 206/882-8080.



The VideoSpigot, Spigot II Tape, and Spigot PowerAV are all incompatible with QuickTime 2.0. Radius hopes to have a software fix available by the middle of March for the Spigot PowerAV. Fixes are also planned for the other two products, but no time line has been set.



If Apple was serious enough about Apple Guide to ship system disks without a full manual, couldn't it at least make sure Apple Guide worked with the company's own software? Alas, Apple Guide is incompatible with At Ease and won't run if At Ease is enabled. Apple says it'll certainly fix it "sooner or later."

Macworld will send you a Bug Report T-shirt if you are the first to inform us of a serious, reproducible bug that we report in this column, or a Turkey Shoot T-Shirt if we shoot your turkey in this space. See *How to Contact Macworld*.

*Suggested U.S. list price. **Larger model lists at \$9,595. †Pantone, Inc.'s check-standard trademark for color. Adobe and PostScript are registered trademarks of Adobe Systems Inc. which may be registered in certain jurisdictions. ©1995 Hewlett-Packard Company PE12501

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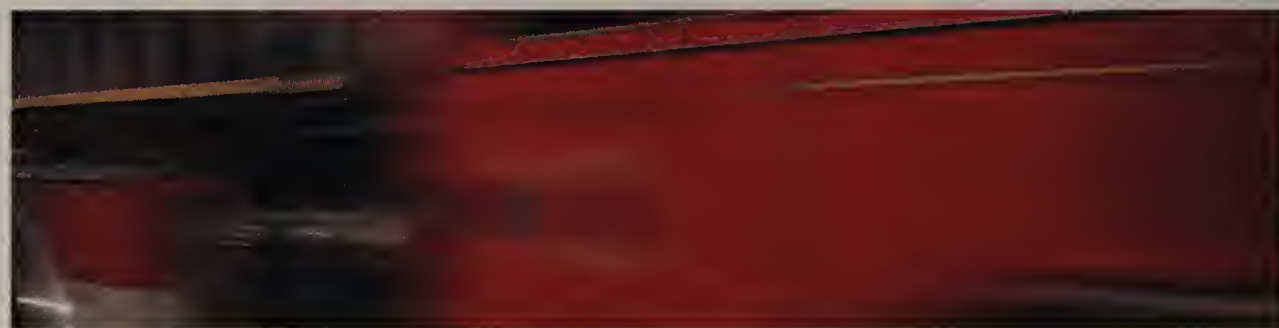
Go on. Give yourself room to think. With the HP DesignJet 650C/PS, you can now print in sizes up to 2' by 9' (up to 3' by 9' with our larger model**). Right in your office. Right away. No tiling. No hang-ups. No problem. Just clean, inkjet output with PANTONE®-licensed colors. Adobe™ PostScript™ Level 2 language and a built-in RIP are included. For an output sample, call:

1-800-354-7622, Ext. 9064.



Circle 11 on reader service card

SEE RED.



Design: Wheeler Design
Photography: Kory Addis

AGFA. FOTOtUNE. RED.

There's RED and there's RED. We see redheads and red fire engines and we paint the town red. And while a rose may be a rose, a red is not always a red. In the world of electronic publishing, this is doubly true. Scanners, monitors, and output devices define color in their own particular "languages" (called color spaces).

FotoTune is the solution. FotoTune, the Color Management System (CMS) from Agfa, takes those different color spaces and creates a "common language" called *ColorTag*. FotoTune insures color consistency throughout the workflow, from scanner to monitor to output device.

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AGFA 

Circle 43 on reader service card

Power Mac News

The 604 Advantage

WHAT THE NEXT POWERPC CPU OFFERS MACINTOSH

Move over, 601—the first Macs using its successor, the PowerPC 604 CPU, will arrive this summer or fall in a high-end Macintosh system. Apple has shown a prototype of such a 100MHz system, which will be in a tower case similar to the Power Mac 8100's and offer six PCI slots for peripheral expansion. (Apple plans to use the 100MHz 604 initially, although it has shown a Mac prototype using a prototype 130MHz 604.)

According to IBM and Motorola, who codesigned the 604, the 100MHz 604's performance is 1.3 to 1.5 times as fast as that of the IBM-designed 100MHz 601 (which is used in the Power Mac 8100/100). Macs using the 604 instead of the 601 won't see as dramatic speed improvements because overall system performance also depends on video, disk, and memory performance; but 604-based Power Macs should still be up to 1.3 times as fast overall as their 601-based counterparts.

For a Power Mac to take full advantage of the 604's speed, it will need a system bus that runs at 66MHz; today's Power Macs' buses top out at 40MHz (for the Power Mac 7100/80 and 8100/80), although Apple is working on faster buses for at least some PCI Power Macs. Ultimately, all Power Macs will use either the 604 or the low-power 603, whose performance is comparable to a 601's.



Inside the 604 What makes the 604 a better CPU than the 601 is its design, which results in higher speeds. One of the biggest contributors to the 604's performance is its ability to process as many as six program instructions simultaneously, compared with a maximum of three for the 601.

Another key 604 advantage is its ability to juggle the order in which it computes instructions. That last ability—which comes from two techniques, called dynamic branch prediction and speculative execution—means the 604 doesn't have to execute instructions in the order received from application software; the 604 can reorder to achieve the most efficient processing and put the various results back into the order the program expects. Intel's Pentium already uses dynamic branch prediction.

Other 604 improvements include better use of internal caches to reduce the chances of the CPU's being forced to wait for the results of other, related calculations that are handled in parallel, and the implementation of a double-precision FPU, which speeds scientific calculations. (The 601 had to convert double-precision numbers to single-precision

format and back again, which slowed processing.)

How the 604 Compares

Although the FPU is improved, the 604's non-FPU performance has improved even more, giving the 10MHz 604 better integer performance than a 100MHz Pentium—the 100MHz 601 and 100MHz Pentium were essentially tied.

The 604's new capabilities and greater number of circuits (3.6 million versus the 601's 2.8 million) means that the 604 consumes much more power: just under 10 watts (the 100MHz 601 consumes 4w; the 80MHz 601, 9w; the 100MHz 603e, 3w; the 90MHz Pentium, 4w; and the 40MHz 68040, 6w). But that compares favorably with Intel's P6, a new CPU that should appear at the end of 1995 and should succeed Pentium. The P6 can consume as much as 20w at 133MHz (Intel says 14w will be more typical), plus part of the power used runs the external 256K cache that on non-P6 systems is a separately powered, separate component on the motherboard.

When both 604-based Macs and P6-based PCs are available, the P6 will run only about 1.1 times as fast as the 130MHz 604, based on Intel and IBM/Motorola estimates. That means the effective speed difference between 604 and P6 systems will come down to how well hardware and software developers tune their products. But the 133MHz P6's cost will be much higher—Intel estimates \$1000 versus the 100MHz 604's current \$550 (a price the 133MHz 604 is likely to inherit when the P6 ships). Even adding a \$200 256K external cache to the 604's price makes the 604 a better deal.—GALEN GRUMAN

Power Watch

THE LATEST ON PRODUCTS FOR THE POWER MAC

- Allegiant offers SuperCard 2.0, a \$695 hypertext authoring tool similar to HyperCard. Upgrades cost \$49 from version 1.7 and \$129 from previous versions. 619/587-0500.

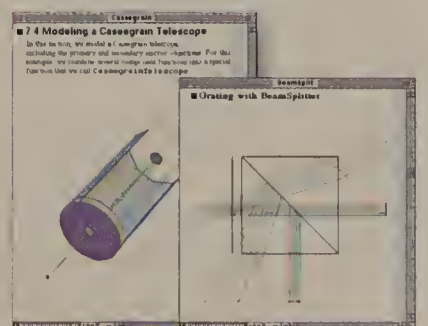
- Electric Image has shipped ElectricImage Animation System, a \$7495 rendering program. The upgrade from version 2.0 costs \$495. 818/577-1627.

- Global Village has upgraded Global Fax to version 2.5. The upgrade costs \$29.95. 408/523-1000.

- Macromedia has shipped Director 4.0, an \$1195 multimedia authoring tool that produces presentations that run on both 680X0 and Power Macs. The upgrade from the 680X0 version 4.0 costs \$25. 415/252-2000.

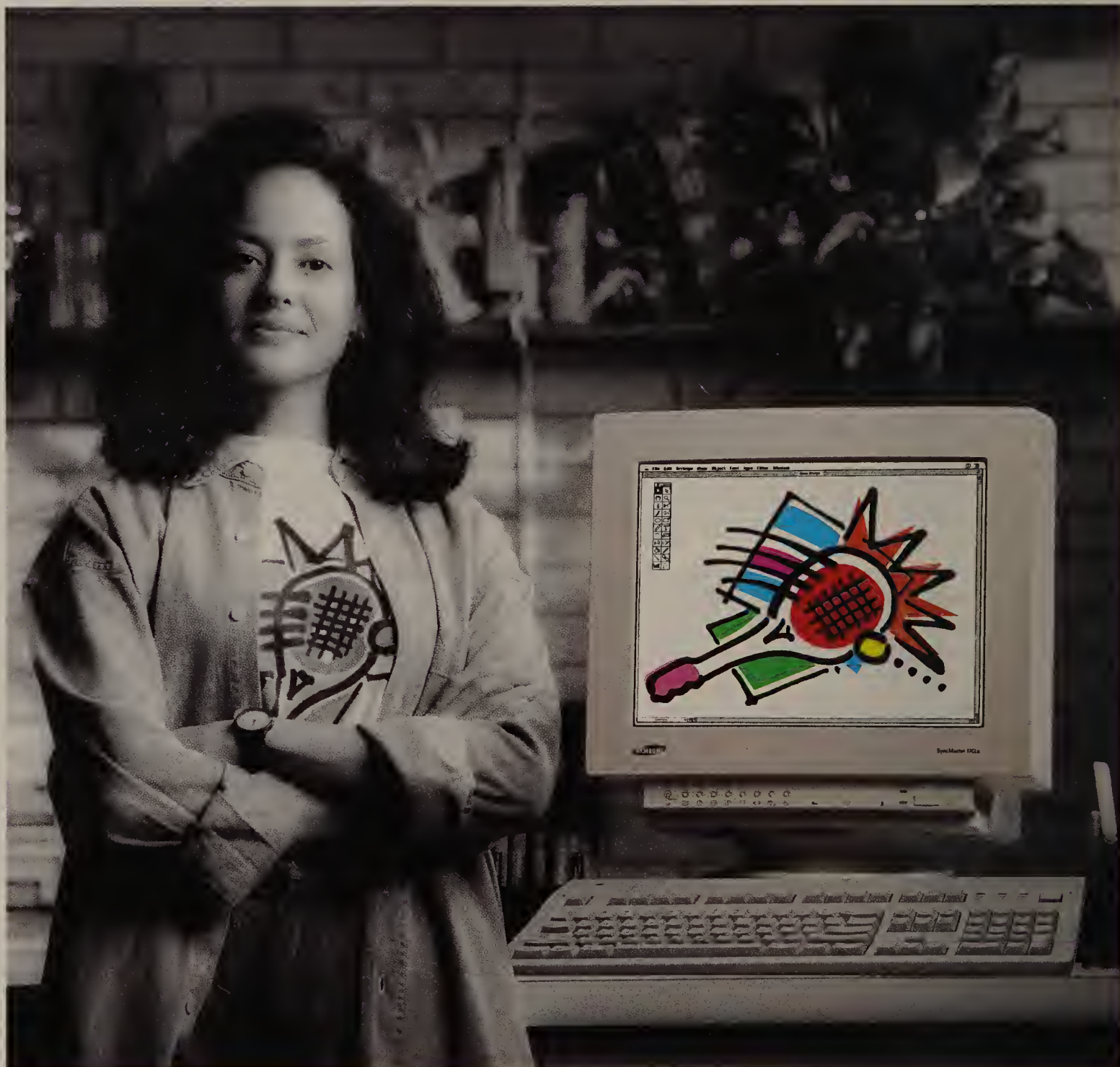
- PixelCraft has shipped the \$995 ColorAccess 1.4.5 color-separation software. Upgrades cost \$199 from version 1.3.3 and \$399 from previous versions. 510/562-2480.

- Wolfram Research is shipping Optica 1.0, a \$695 tool for mathematical modeling and data analysis. 217/398-0700.—GALEN GRUMAN



Wolfram's Optica 1.0 uses the PowerPC to speed up 3-D and other mathematical operations.

Samsung. Mac's new point of view.



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Maximum Refresh Rate at Maximum Res. (Hz)	75	75	75	75
MPR-II (Low Radiation)	•	•	•	•
Power Management	•	•	•	•
Flat Square Screen		•	•	•
On-Screen Programming			•	•
Real Color Control				•
Warranty	2 Years	2 Years	2 Years	2 Years

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Circle 198 on reader service card

Macworld Online

by Macworld Online Staff

Logging on to a commercial online service is a cinch. But unless you're at a university or large corporate site, logging on to the Internet is a good deal trickier.

Selecting the best local Internet provider is the first hurdle. Then you must decide whether to choose a cheap *shell* account that restricts access to command-line, dumb-terminal emulation or whether to opt for something more expensive. *Dial-up* access (via SLIP or PPP communications protocols) and *dedicated* access (using leased-line ISDN or T1 connections, for instance) allow some graphic display when used with Internet-savvy applications: *Telnet* logs on to a remote server as a terminal; *FTP* downloads files from remote servers; *Gopher* searches server databases for topics of interest; *IRC* (Internet Relay Chat) offers awkward real-time exchanges; E-mail programs give you a mailbox on the Internet. Newer World Wide Web browsers are somewhat more intuitive, and a few browsers integrate suites of the above applications.

Inevitably, Macintosh users will find Internet interfaces somewhat arcane. But for hardy souls, many rewards await on servers worldwide.

Free and Cheap

In the open spirit of the Internet, many of the applications that you can use to get around are free or shareware. We've

culled a few useful examples from our libraries on America Online and eWorld.

Netscape 1.0N isn't the only Web browser, but in the fast-paced whirl of the Net, it's currently the best. This Netscape Communications offering is stable, easy to use, and boasts features others are sure to emulate (425K; still free).

World Wide Web browsers require helper applications for many tasks. Maynard Handley's graceful Sparkle makes it a pleasure to play QuickTime movies or to view MPEG images online (806K; free).

Choosing a local Internet provider and downloading

files via FTP can be a gamble, but Tom Hyde's and Bruce Grubb's macFTPbase offers useful information about hundreds of Internet service providers and FTP sites. The suave online glossary is an added bonus (120K; \$5).

Once you've embarked on the Internet, Milwaukee High School's Best Mac Internet Sites 2.0 reference provides pointers to a variety of servers of special interest to Macintosh users (114K; \$5).

For those ambitious enough to sport more than one Internet connection, John Norstad's MacTCP Switcher offers a compact solution for saving and restoring multiple configurations (3K; free).

LIVE-EVENTS CALENDAR

One advantage open to the online adventurer is the opportunity to exchange ideas with seminal thinkers. Macworld Online cordially invites one and all to attend informative and entertaining live events that feature our industry's most noted authors, editors, pundits, and power users. Please come armed with questions, comments, and critiques. AOL events in April are on Thursdays, and all eWorld events are on Wednesdays. All events are at 6 p.m. Pacific standard time.

Future Macs March 28, AOL

Macworld executive editor Galen Gruman discusses upcoming features to be found in Macintosh operating systems. We welcome questions, wish lists, and advice for Apple.

Ask Cary Lu April 5, eWorld

In his monthly *PowerBook Notes* column, contributing editor Cary Lu covers mobile- and remote-computing issues. Online, Cary addresses these topics and more. Please join us.

Troubleshooting with Pogue
April 6, AOL
Readers familiar with *Desktop Critic* author David Pogue know they

can expect lively and up-to-the-minute repartée at this monthly troubleshooting free-for-all. Bring your trickiest questions!

Mac Clone Update April 13, AOL

Wondering just how all this hoopla surrounding Macintosh clones might affect you? Macworld senior editor Charles Piller brings us up to date on this most intriguing topic.

Steve Costa's Clinic April 19, eWorld

You might have a Macintosh-related question that Macworld Online administrator Steve Costa can't answer, but we doubt it. Go on. Give it a try. We dare you.

The Dawn of DTP April 20, AOL

In 1985, desktop publishing maven Jay Kinney launched *Gnosis* magazine on an ancient Mac. With the periodical's tenth anniversary looming, Jay answers questions both digital and philosophical.

Jim Heid Q&A April 27, AOL

Jim Heid has invested his many books and hundreds of Macworld columns with wit, wisdom, and a remarkable Macintosh savvy. Join Jim for an hour of fast-paced Q&A.

Mac Meets the Web

Macintosh-specific Web sites are few in number but well worth a gander. Among our favorites are Lentz's Macintosh Resources, a hearty compilation of Macintosh Internet resources at <http://www.astro.nwu.edu/lentz/mac/home-mac.html>. Finding a piece of shareware amid the vast expanse of the Internet can be frustrating, but the task is much easier if you consult the Searchable Macintosh Shareware Catalog at <http://web.nexor.co.uk/public/mac/archive/doc/search.html>.

Adam Engst is the author of the excellent tome *Internet Starter Kit for Macintosh* (Hayden Books, 1994), a must-read for Internet newbies. He and Tonya Engst also edit the online publication TidBits, a mélange of news, reviews, tips, advice, essays, and wry observations, all (or mostly) Macintosh-related. View it at <http://www.dartmouth.edu/pages/TidBits/TidBits.html>.

And finally, setting up your own World Wide Web site can be a gargantuan task (just ask us, we're in the process of working on ours), but Web66 guides Macintosh users through the steps at <http://web66.coled.umn.edu/Cookbook/contents.html>. [m](#)

REACHING MACWORLD ONLINE

America Online and eWorld
Keyword is Macworld

There's the one

where you're suddenly standing onstage

at the senior prom wearing only really

big underwear and a fez.

And everyone is laughing hysterically,

including Mr. Dimnitz

your guidance counselor.

Then there's
the one

where your computer's
hard drive fries 30 minutes before the big
presentation, and you've

lost everything.



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dantz

Circle 26 on reader service card

New Products

THE LATEST MACINTOSH RELEASES

by Cameron Crotty

THIS SECTION COVERS MACINTOSH PRODUCTS FORMALLY ANNOUNCED BUT NOT YET EVALUATED BY MACWORLD. UNLESS OTHERWISE STATED, ALL PRICES ARE SUGGESTED RETAIL AND THE MINIMUM REQUIREMENTS FOR OPERATION ARE A MAC PLUS WITH 1MB OF RAM, RUNNING SYSTEM 6. A  SIGNIFIES THAT A NATIVE POWER MAC VERSION OF THE PRODUCT IS AVAILABLE. ALL INFORMATION AND PERFORMANCE CLAIMS ARE SUPPLIED BY THE PRODUCT VENDOR AND HAVE NOT BEEN INDEPENDENTLY VERIFIED BY MACWORLD. PLEASE CALL VENDORS FOR INFORMATION ON AVAILABILITY.

HARDWARE

1060e, 1660e, 1725e Print Systems

The new office standard is 600 dpi, and these laser printers all fill the bill. The 1060e is a 10-ppm, 600-by-600-dpi printer that prints up to legal-size sheets; the 1660e puts out 16 ppm at 1200 by 600 dpi and prints full-bleed on 11-by-17-inch pages; the 1725e puts out 17 ppm at 600 by 600 dpi and prints up to legal-size sheets. All three printers come standard with serial, parallel, and Ethernet ports; Token Ring and LocalTalk connections are available as options. 1060e \$2399; 1660e with 12MB of RAM \$3999, with 24MB \$4899; 1725e \$4999. QMS, 205/633-4300, 800/523-2696; fax 205/633-4866.

DaynaPort E/CS

There are only a few cards that you can buy for the Communications Slot that appears on some Macintoshes, and Apple makes most of them. But now Dayna has an Ethernet card for the Comm Slot. The DaynaPort E/CS is available in both 10BaseT and thin Ethernet flavors, and it works with the LC 575 and



DaynaPort E/CS

630; the Performa 475, 476, 570, 575, 577, 578, and 630; and the Quadra 630. 10BaseT \$109; thin Ethernet \$119. Dayna Communications, 801/269-7200; fax 801/269-7363.

DisplayMaker Express

The DisplayMaker Express wide-format printer has an external raster image processor with 64MB of RAM; users can spool jobs from their machines and continue working. The output vehicle is a large-format (54 inches wide), solid-ink (also known as phase-change ink), CMYK printer with a maximum resolution of 300 dpi. The printer features the company's SmoothTone stochastic-screening image-enhancement technology. The printer also uses drop-in ink pucks, and it signals when a particular color is running low so users can add another puck on the fly. Comes standard with simultaneously active LocalTalk, parallel, serial, 10BaseT, and thin Ethernet (Ethernet, TCP/IP, NetWare) ports, plus a SCSI port for storage expansion. \$79,995. LaserMaster Corp., 612/944-9330, 800/477-7714; fax 612/944-1244.



DisplayMaker Express

DrawingSlate II

CalComp is shipping a new version of its graphics tablet, the DrawingSlate II. This tablet has a resolution of 2540 lines per inch, a smoother drawing surface, and a row of macro buttons on the border of the tablet. The macro buttons include 18 user-programmable function keys, plus preprogrammed macros for cut, copy, paste, open, save, and undo. The tablet comes in three sizes: 6 inches by 9 inches (cordless, two-button, pressure-sensitive pen included), 12 inches by 12 inches, and 12 inches by 18 inches. The pen is sold separately from the larger tablets. 6-by-9-inch tablet with pen \$395; 12-by-12-inch tablet without pen \$395; 12-by-18-inch tablet without pen \$595; cordless pen \$150. CalComp, 714/821-2000, 800/932-1212; fax 714/821-2832.

Elite XL608 and XL808

Aimed at the SOHO market, the XL608 is a 600-dpi-by-600-dpi, 8-ppm printer



Elite XL608 and XL808

that can handle pages up to 11 inches by 17 inches. The printer ships with 6MB of RAM, a 250-sheet paper tray, 35 resident fonts (and another 45 fonts on floppy disks), and autoswitching PostScript Level 2 and PCL 5 emulation. Ethernet support and a 500-sheet paper tray are available as options. For those who need a larger print area, the XL808 is an 800-dpi-by-800-dpi, 8-ppm tabloid printer that comes with 12MB of RAM and Ethernet. The printer ships with 35 resident fonts and a CD-ROM with an additional 250 fonts. The XL808 also features AccuGray, software that improves halftone imaging. XL608 \$2599; XL808 \$3799. GCC Technologies, 617/275-5800, 800/422-7777; no fax.

FlexScan F2 Monitors

Nanao has introduced the F2 series, a group of 15-inch, 17-inch, and 21-inch multiresolution color monitors. The FlexScan F2•15 and F2•17 have dot pitches of 0.28mm and maximum Mac resolutions of 1152 by 870 pixels at a 75Hz vertical refresh rate. The F2•21 has a 0.28mm dot pitch and a maximum Mac resolution of 1600 by 1200 pixels at a 72Hz vertical refresh rate. The F2•17EX, with a 0.26mm dot pitch, supports a maximum Mac resolution of 1280 pixels by 1024 pixels at an 80Hz vertical refresh rate. The FX2•21, also with a 0.26mm dot pitch, is the company's highest-end offering, supporting a maximum Mac resolution up to 1600 pixels by 1200 pixels at an 80Hz vertical refresh rate. All monitors except for the F2•15 include Nanao's ScreenManager Digital On Screen Display control software, and all monitors meet the Swedish MPR II guidelines and are Energy Star-compliant. F2•15 \$564; F2•17 \$890; F2•21 \$1790; F2•17EX \$999; FX2•21 \$2957 estimated company prices. Nanao USA Corp., 310/325-5202, 800/800-5202; fax 310/530-1679.

Genova Monitors

Genova, a new monitor manufacturer, is selling two 15-inch and two 17-inch displays. The TC1015 and T1015 AT-AR are 15-inch monitors that display color and gray scale, respectively. Both monitors have resolutions of 640 pixels by 870 pixels at a 75Hz vertical refresh rate. The TC1017 is a 17-inch color monitor with a resolution of 832 pixels by 624 pixels at a 75Hz vertical refresh rate. The TC178X is a multiresolution 17-inch color monitor displaying resolutions up to 1024 pixels by 768 pixels at 75Hz. TC1015 \$599; T1015 AT-AR \$399; TC1017 \$699; TC178X \$749. Genova, 310/538-4102; fax 310/538-1754.

HR 2500

Aimed at engineering, medical, and CAD markets, this 10.4-inch, color LCD panel projects images at 1024-by-768-pixel resolution with a maximum of 16.7 million colors. With an optional video adapter, the panel can display NTSC, PAL, and SECAM video. \$12,995; video adapter \$995. Polaroid Corp., 617/386-2000, 800/816-2611, ext. 9; fax 617/386-9339.



HR 2500

InterTalk EN

This AppleTalk-only, two-port Ethernet router is designed to segment traffic on an Ethernet LAN. Both ports have AAUI connectors, and the InterTalk EN features flash EPROMs for future protocol upgrades. Management and configuration are via the company's proprietary software (included). \$1499. International Transware, 415/903-2300, 800/999-6387; fax 415/903-9544.

LCD1280

About the size of an Apple StyleWriter printer (imagine a coffee-table book standing on its spine), this active matrix, color LCD display has a 13-inch viewing area that can display resolutions of 1280 pixels by 1024 pixels or 640 pixels by 480 pixels. The LCD1280 requires a *continues*

New Products

Radius Thunder IV graphics card. \$11,755. NEC Technologies, 708/860-9500, 800/632-4636; no fax.

Magicolor Plus

This color laser printer improves on the Magicolor printer by adding QMS's Qcolor color-management technology and bumping the speed to 3 ppm for color and 12 ppm for black and white. The Magicolor Plus comes with built-in LocalTalk, serial, and parallel ports; Ethernet and Token Ring are available as options. The 12MB version prints at 600 dpi in black and white, 300 dpi in color; the 24MB version prints at 600 dpi in either black and white or color. 12MB \$8999; 24MB \$9699. QMS, 205/633-4300, 800/523-2696; fax 205/633-4866.

MCA230 Plus

Mitsubishi Chemical America, a longtime provider of magneto-optical media under the Verbatim brand name, has entered the drive market with a SCSI 3½-inch 230MB magneto-optical drive, the MCA230 Plus. The drive ships with a driver in firmware that loads into your Macintosh's memory and optionally compresses data before writing it to a specially prepared disk (utility software is included). Also, since the driver is in firmware, it loads at start-up and automatically mounts on the desktop any disks that you place in the drive. \$930 company's estimated price. Mitsubishi Chemical America, 408/954-8484, 800/347-5724; fax 408/232-0164.

SupraExpress 144 Plus

What's cool about a 14.4-Kbps fax modem, other than the fact that you'll own it for a C-note? The answer is that it draws its power from the ADB port. The 144 Plus supports the standard ITU-T data-transmission, data-compression, and error-correction protocols up to V.32bis. It is also compatible with Group III fax devices and supports the V.17 fax protocol. \$109. Supra, 503/967-2410, 800/727-8772; fax 503/967-2401.

TribeLink 2

The two RS-232 serial ports (maximum 112-Kbps throughput, upgradable) on this remote-access server support connections from leased-line or standard modem connections. The TribeLink 2 has one 10BaseT and one AAUI port, and will support AppleTalk over PPP, TCP/IP, and IPX over PPP by the end of the second quarter of 1995. \$995. Tribe Computer Works, 510/814-3900, 800/778-7423; fax 510/814-3980.

ViewSonic 20PS and 20G

ViewSonic is drawing a bead on graphics professionals with these two new 20-inch monitors. Both monitors support a maximum Macintosh resolution of 1600 by 1200 at 66Hz and have a 0.28mm dot pitch. The ViewSonic 20PS includes the On-View control system that lets users adjust over 20 different monitor characteristics using on-screen controls. The displays meet the Swedish MPR II guidelines and are compliant with the Energy Star program. 20G \$495; 20PS



ViewSonic 20PS

\$1695. ViewSonic, 909/869-7976, 800/888-8583; fax 909/869-7958.

Xpanse N800

This eight-NuBus-slot expansion chassis is designed for video producers and others who use multiple high-end NuBus-based accessories. The rack-mounted box connects to a NuBus slot inside any Mac with NuBus, including the Centris and Quadra 610 and Power Mac 6100 with the \$129 Apple PDS-to-NuBus adapters). Readers should note that, due to NuBus problems, the Power Mac 6100 will support only four out of eight slots. \$1795. Second Wave, 512/329-9283; fax 512/343-9663.

the preparation of Macintosh graphics for digital-media display while retaining typographic and graphic quality. A Chooser-level QuickDraw driver creates PICT files from applications such as QuarkXPress and Adobe's PageMaker, Illustrator, and FreeHand, while a second component of the package processes PostScript text and graphics. Adobe ScreenReady supports batch processing, two antialiasing modes (one for computer screen display, the other for TV), and custom palettes. 8MB min. memory, requires Mac IIx, System 7.1. \$199. Adobe Systems, 415/961-4400, 800/833-6687; no fax.

Alone in the Dark

You enter a mysterious, horrific, 3-D world of zombies, ghosts, magic, and murder in this mystery adventure game. Explore the shadowy corridors and secret passages of a haunted mansion and piece together the final days of Jeremy Hartwood. Was his death a suicide, or was Jeremy the victim of something foul and dark? 3MB min. memory; requires 8-bit color. \$39.95 estimated street price. MacPlay, 714/553-6678, 800/969-4263; fax 714/252-2820.

Apple LocalTalk Bridge

Step up to higher-speed networks without giving up your LocalTalk network. With Apple's LocalTalk Bridge software installed, a Mac connected to a LocalTalk network can simultaneously connect to an Ethernet or Token Ring network. You can open the LocalTalk network segment. *continues*

SOFTWARE

Adobe ScreenReady

Currently, preparing graphics files for multimedia, video, and online use requires a lot of time and expensive software. Adobe ScreenReady software rasterizes documents and EPS files, easing

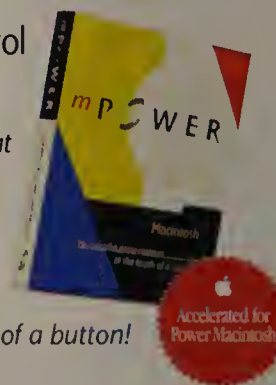
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SOFTWARE

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Circle 5 on reader service card





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GREAT NEWS FOR MAC IIsi, IIfx & IIfx OWNERS. MacUser magazine says DayStar's Turbo 601 will, "Turn your Mac IIfx into a real PowerPC screamer." Now the Turbo 601 is available for the Mac IIsi, IIfx, IIfx and Performa 600. It's an easy-to-install upgrade that will make your Mac 8 to 10 times faster. It's like owning a Power Macintosh 6100 for a lot less.

100 MHz POWERPRO 601! Need more speed? With DayStar's new 100 MHz PowerPro 601, your Centris 610, 650, Quadra 610, 650, 700, 800, 900 or 950 runs faster than a Power Macintosh 8100—for considerably less than buying a new machine. PowerPro 601 is the PowerPC upgrade for power users.

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Circle 7 on reader service card

ment to the larger network, or keep it private. While the bridge is active, you can't have routers active on the LocalTalk stub. \$99. Apple Computer, 408/996-1010, 800/538-9696; no fax.

Chagall

This lean, mean, graphics machine brings painting and image processing to Macs that are lacking in the horsepower department. A 24-bit color program, Chagall supports filters (Sharpen, Blur, Invert, and others), masking, and unlimited undos. The software also includes a painting tool set with several different brushes. 4MB min. memory; requires System 7. \$299. Technosystems USA, 619/427-0108, 800/417-0108; fax 619/427-2180.



Chagall

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Have you ever decided to give your U.S. Congressional representative a piece of your mind and then spent days trying to find the correct name, address, or fax number? Fax Congress Now contains contact information for the president, vice president, and every representative and senator in the 104th Congress. Users will also find biographical information and each politician's home state, political party, and committee assignments. Fax Congress Now also includes a basic text editor for drafting impassioned missives. \$14.95. Patriot Software, 713/467-7507, 800/316-6468; fax 713/467-3769.

Insta Personal Information Managers

Each of these nine personal information managers is designed for a specific type of user, and all are based on Chang Labs' CAT relational database software. All the PIMs can handle contact information, scheduling, and to-do lists; each program is then customized with specialized forms. For instance, Insta Printer includes quote, estimate, and work-order forms for copy and print shops. Chang Labs is now shipping Insta Printer, Insta Invoice, Insta Photographer, Insta Realtor, Insta AddressBook, Insta Consultant, Insta Contact, and Insta Purchasing. \$19.95 each. Chang Labs, 408/727-8096; fax 408/252-3081.

Looney Tunes Screen Saver

Swifter than you can say "sufferin' succotash," Sylvester, Tweety, Elmer Fudd, and the rest of the Looney Tunes cast of characters can be parading across your monitor while you're diligently not working. There are 12 After Dark 3.0 modules in this package, including Tasmanian Desktop, Marvin's Invasion (starring Porky Pig, Daffy Duck, and your favorite Martian), Puddy Tat Splat, and Desquettoppe D'Amour with Pepe Le Pew. \$29 estimated street price. Berkeley Systems,

510/540-5535, 800/251-1733; fax 510/540-5115.

Miles of Tiles

Part of the Really Cool Texture series from Fractal Design, these textures are for use with Fractal Design Painter and Fractal Design Sketcher. The textures interact with those software packages' natural-media tools, making it possible to paint with textured ink or paint. The textures can also be used as backgrounds or applied to existing images to create a 3-D surface. The Miles of Tiles patterns replicate tile motifs, including Southwest and Navajo, Japanese, and Roman. Requires Fractal Design Painter 2.0 or Fractal Design Sketcher. \$29.95. Fractal Design Corp., 408/688-8800, 800/647-7443; fax 408/688-8836.

StockTrend

Closely tracking the stock market used to involve reams of paper and hours of data processing by hand. StockTrend takes price-history data, then generates 30 common technical indicators and signals, including moving averages, trend lines, and relative strength index (RSI). Users can perform technical and intermarket analysis to evaluate investment opportunities (stocks, bonds, options, commodities, mutual funds, and others). Integrated Globaltec also offers subscriptions to DataFeed, a database service that provides the price-history data on either a per-quote or flat-fee basis. 4MB min. memory; requires System 7. \$210. Integrated Globaltec, 403/531-4888; fax 403/521-4889.

Swap, Sqizz

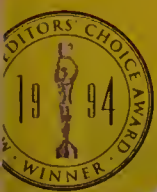
Human Software is shipping two new Photoshop plug-ins. With Swap, you can create duotones, tritones, quadtones, ghosting effects, and CMYK gradations. With Sqizz, you can distort images using a brush—expanding or pinching, enlarging or shrinking areas of an image. You can also place an image on a grid and distort any point on the grid, or group and distort grid points simultaneously. Requires Photoshop 3.5; Sqizz requires an FPU and 15MB of free RAM. Swap \$199; Sqizz \$129. Human Software, 408/741-5101; fax 408/741-5102.



Swap, Sqizz

The Totally Twisted Screen Saver

Warning: This item is rated PG for Pretty Gross. Were you the kind of kid that fried ants with a magnifying glass? Then this latest After Dark screen saver is for you. Get ready to run from 14 of the most maladjusted, demented, and downright repulsive screen savers ever to appear on the Macintosh. See toilets flap across the screen. Watch as Phlegm Boy leaves *continues*



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behind ugly surprises. Take potshots at mimes. Frolic in the Toxic Swamp, and watch as daredevils, cows, and fish bungee-jump with disastrous results. \$29.99 estimated street price. Berkeley Systems, 510/540-5535, 800/251-1733; fax 510/540-5115.

TurboTalk

Who couldn't use a faster network? This software installs on networked Macintoshes and transparently speeds up network transactions. The company claims that it can make AppleTalk file transfers run twice as fast without hogging the entire network's bandwidth. Also, packets coming from a Mac running TurboTalk appear as completely normal to a Mac not running TurboTalk. \$69 per client; \$395 for AppleShare server. IPT, 805/541-3000; fax 805/541-3037.

Walls and Reliefs

Another in the Really Cool Texture series from Fractal Design, the Walls and Reliefs textures include African mask designs, Celtic circles, hieroglyphs, and art deco-style reliefs. The textures can be applied to existing images to create a 3-D surface, applied with Fractal's natural-media tools as ink or paint, or used as backgrounds. Requires Fractal Design Painter 2.0 or Fractal Design Sketcher. \$29.95. Fractal Design Corp., 408/688-8800, 800/647-7443; fax 408/688-8836.

Warlords II

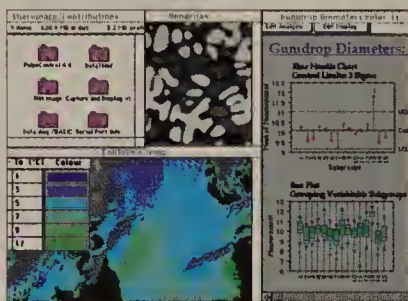
Return with us now to the days of yesteryear, when dragons were dragons

and sweaty beings swung, dropped, and hurled sharp objects at each other in search of glory and empire. Version two of this popular strategy war game features diplomatic relations, reworked color graphics, all new army types, random worlds to conquer, and smarter computer opponents. 4MB min. memory; requires System 7, 8-bit color. \$69.95. Strategic Studies Group, 904/469-8880; fax 904/469-8885.

CD-ROMS

Data Acquisition, Image Acquisition, Data Analysis CD-ROM

This second edition of the CD-ROM includes technical notes on and programs for acquiring, analyzing, and visualizing data on the Macintosh. It includes turbo drivers for GW Instruments' data-acquisition hardware and all publicly available virtual instruments for National Instruments' LabView engineering software. \$59 for nonmembers.



Data Acquisition, Image Acquisition, Data Analysis CD-ROM

MacSciTech Users Association, 508/755-5242; fax 508/795-1636.

Frankenstein: Through the Eyes of the Monster

As your eyes flutter open, your last memory is of a rough rope noose snapping tight around your neck as you dangled from the gallows for a crime you didn't commit. But you weren't saved at the last second; you died, and now Dr. Frankenstein (played by actor Tim Curry) has resurrected you. In this live-action video adventure game, you must overcome mysteries, puzzles, and the frayed emotions of those around you as you search for your own humanity and the truth about Dr. Frankenstein. 4MB min. memory; requires 25MHz 68030. Price not available at press time. MacPlay, 714/553-6678, 800/969-4263; fax 714/252-2820.

SimTown

Why let grown-ups have all the fun of urban planning? Designed for children ages 8 to 12, SimTown lets kids design, build, and manage their own neighborhood, complete with people; pets; and various types of houses, parks, streets, and stores. While the concepts are kept simpler for younger minds, players will have to deal with real-life problems, such as finding places for their Sims to live and work, transporting them around their virtual town, providing government services, and balancing growth versus environmental issues. \$44.95. Maxis, 510/254-9700, 800/526-2947; fax 510/253-3736.



Wacky Races

Wacky Races

Penelope Pitstop, Dick Dastardly, Muttley, and the Gruesomes are all back on the road again in this adventure game adapted from the Hanna-Barbera cartoon of the same name. Users bet on the outcome of the Wacky Races in order to obtain driving cards that provide entry into different worlds. Once in the worlds, players must find Dick Dastardly and Muttley and foil their evil schemes. 4MB min. memory; requires Mac IIci, 8-bit color. \$49.95. Future Pirates, 310/396-6788, none; fax 310/396-0898.

ACCESSORIES

Boing Notebook Computer Covers

Here's a snug cover for your personal PowerBook. Boing covers are made out of neoprene, close with a zipper, and have an internal pocket for accessories. The covers are available with or without nylon webbing handles, and all the covers stretch tightly around the PowerBook in case you want to slip the machine inside another, more capacious, carrying *continues*

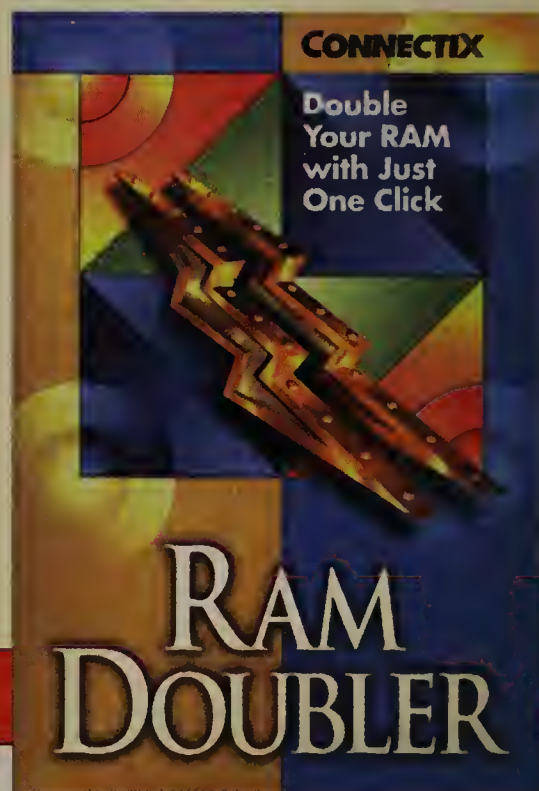
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Large selection of 2-dimensional graphs: *Histograms (incl. multiple, clustered breakdowns, overlaid functions); Scatterplots (incl. multiple, weighted frequency, smoothed, function fitting); Multiple line and Range plots; Trend plots; Standard deviation plots; Data sequence diagrams; Contour plots; Box-and-whisker plots; Column plots; Bar graphs; Double pie charts; Scrollable dendrograms; Two-way joining plots; Curve fitting plots; Distribution comparison plots; Range plots; Probability plots; Amalgamation plots; Factor space plots; Casewise outlier and residual diagrams; ANOVA interaction plots; Multivariate (multiple) matrix plots; exploratory Draftsman plots with histograms, categorized (multiple) graphs, and many other specialized plots.*

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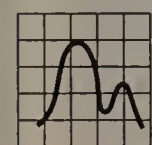
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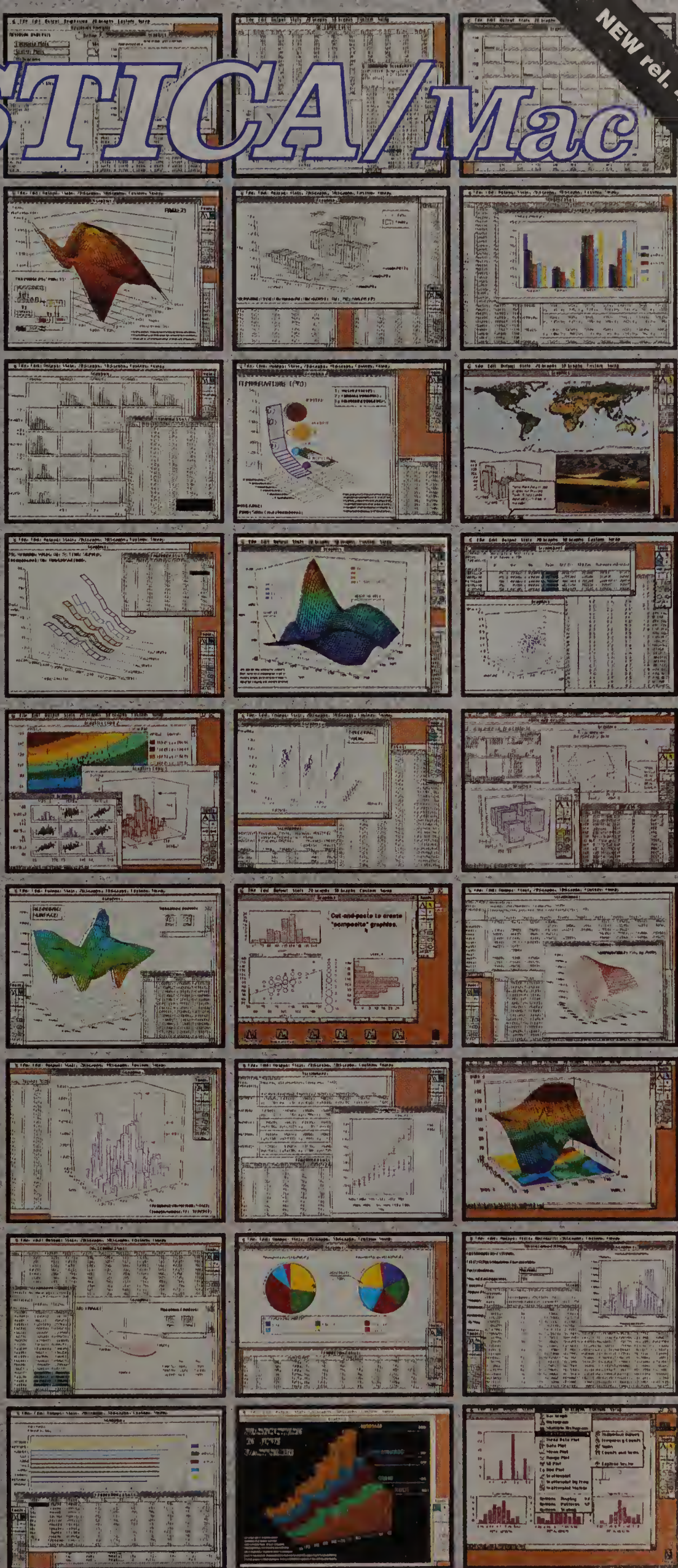


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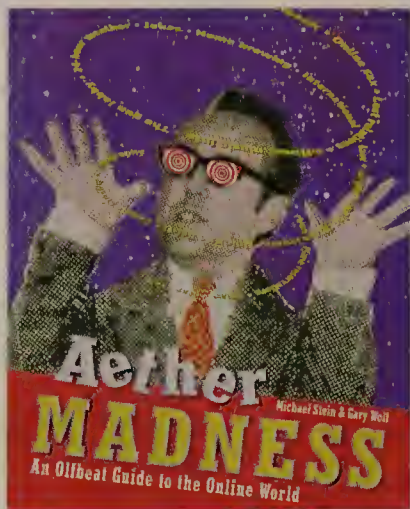
BOOKS

Aether Madness

Billing itself as "An Offbeat Guide to the Online World," this book is divided into four sections. The first, Orientation, sets the hardware and software stage for the novice. Travel Tales covers independent BBSs, online services, and the more common Internet services (Usenet, FTP, Gopher, the Web). The Glossary is a guide to cyberspace terms, and the Resource Guide helps readers find what they need. Written by Gary Wolf and Michael Stein. 312 pages. \$21.95. Peachpit Press, 510/548-4393, 800/283-9444; fax 510/548-5991.

Director 4 For Macintosh: Visual QuickStart Guide

The Visual QuickStart Series books consist primarily of illustrations, with text



Aether Madness

playing a supporting role. This book about Director 4 teaches readers how to animate text and graphics, use sound, set scene transitions, and add interactive controls to movies. The book is coauthored by Helmut Kobler and Andre Persidsky. 220 pages. \$18.95. Peachpit Press, 510/548-4393, 800/283-9444; fax 510/548-5991.

E-Mail Security

Subtitled *How to Keep Your Messages Private*, this book discusses the issues of privacy and electronic mail, alerting users to how a message might be intercepted, read, copied, or altered, and how they can enhance the privacy of their own E-mail. Author Bruce Schneier covers encryption, authentication, patents, governmental regulations, and export law, and compares software designed to help

you keep your private thoughts private. 352 pages. \$24.95. Wiley & Sons, 212/850-6630; 212/850-6799.

The Hitchhiker's Guide to America Online

Need help navigating one of the largest commercial online services? Author Charles Bowen offers a road map of America Online's procedures, features, and fine points. The book is organized alphabetically and cross-referenced, offering specific text on individual features and broad overview articles on general subjects. Readers will also learn about AOL's social environment. 385 pages. \$21.95. MIS:Press, 212/886-9200, 800/488-5233; fax 212/633-0748.

Modems For Dummies, Second Edition

Whether you're a fumble-fingered bit-novice or a weathered veteran of the Internet, this book (published by Macworld's sibling company, IDG Books Worldwide) will bring you up to date on the latest modem hardware and software. Author Tina Rathbone covers everything from what plugs in where, to tips on cruising online services and the Internet. 496 pages. \$19.99. IDG Books Worldwide, 415/655-3000, 800/762-2974; fax 415/655-3299.

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Even the most sophisticated computer guru can be reduced to a sniveling puddle of slime by the simplest financial planning. Author Phil Robinson teaches

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Privately owned and operated bulletin-board systems (BBSs) don't get the same limelight as the big commercial online service providers, but there's a wealth of resources out there if you're willing to do a little exploring. In the third edition of his book, author John Hedtke teaches novices about BBSs and basic telecommunications concepts. He then moves on to create a hands-on guide for intermediate and advanced users, covering everything from the Internet to major online services, to smaller, private BBSs. There are also tips on how to set up your own BBS. 550 pages. \$29.95. MIS:Press, 212/886-9200, 800/488-5233; fax 212/633-0748. **m**

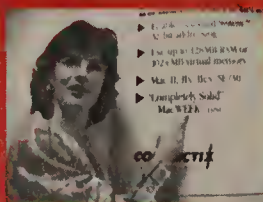
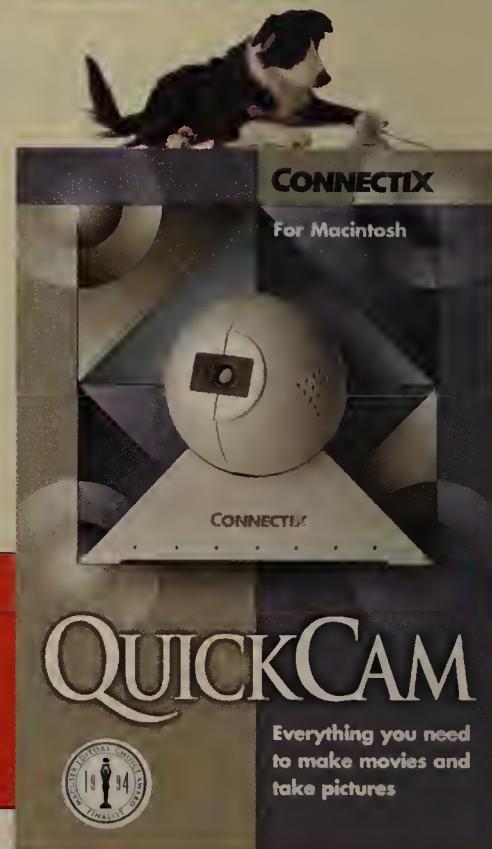
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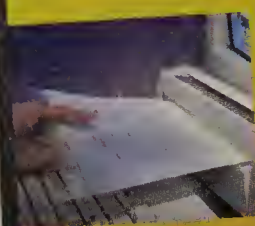
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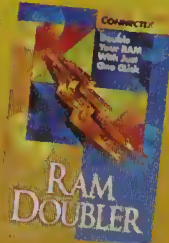
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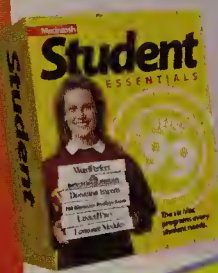
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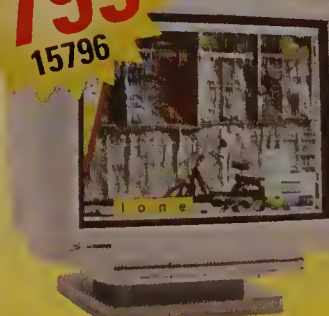
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Reviews

Macromedia FreeHand 5.0

Draw Program

PROS: External modules available as tools; supports Illustrator plug-ins; eyedropper tool lifts colors from imported TIFF images; improved color naming and modifying; fully functioning paragraph styles; can hide and show the tab ruler; fast.

CONS: Interface still needs some reigning in; worthless smudge tool; Multi-Color Fill function not integrated into standard gradients.

COMPANY: Macromedia (415/252-2000).

LIST PRICE: \$595.



I USED TO CHASTISE professional drawing stalwarts FreeHand and Adobe Illustrator for not being aggressive enough with their upgrades. No more. In the past two years, both programs have changed substantially. If FreeHand 5.0 is any indication, the trend is hardly in decline.

Name a feature in Illustrator 5.5 that has been absent in FreeHand and you're liable to find it in FreeHand 5. Among the many features no longer unique to Illustrator, you can now count custom guidelines, multiple-color gradients, external special-effects options, multiple views of a document, text search and a spelling checker, one-key cloning, color-modification controls, and object-specific trapping. FreeHand 5 also throws in its own unique features, including tab leaders, style sheets, and better object slicing.

FreeHand 5's interface, however, remains as awkward and bulky as that of its predecessor. FreeHand 4 users will probably feel right at home, but I doubt if people who shied away from that version will be any happier with version 5. Oh sure, now and then the new FreeHand makes an effort to bring old users into the fold. For example, you can now choose to edit



MARK JASIN

text either directly on the page or inside a dialog box, and you can hide the annoying text ruler. But the overall picture remains one of a program ready to burst at the seams, with 13 palettes and more than twice as many dialog boxes as in version 4. If you avoided FreeHand 4, prepare yourself for a substantial learning curve. The good news is that this time the payoff is even bigger.

FreeHand Extends Its Reach

Like Illustrator, Adobe Photoshop, and others, FreeHand now supports external modules—which it calls Xtras—that add functions to the program. It can even use your Illustrator plug-in filters; just make aliases for them and place them in the Xtras folder. In my testing, the only Illustrator filters that didn't work inside FreeHand 5 were the automatic-selection

functions. Best of all, FreeHand's Xtras are accelerated for Power Macs (Illustrator's filters run in the slower emulated mode in FreeHand).

In Illustrator, plug-ins always appear as commands under the Filter menu, but Xtras can manifest either as tools or commands. The tools are generally successful, allowing you to draw spirals and distort selected objects by dragging inside the drawing area. (Illustrator forces you to negotiate inside static dialog boxes.) Among the Xtras is the 3-D rotation tool, which lets you spin objects in three-dimensional space; you define the perspective and horizon point before using the tool. To use the fish-eye lens tool, you draw an ellipse that represents the shape of the lens; FreeHand distorts the object around it. You can't preview the fish-eye effect during the drag, but the effect is

quick and reliable. The only disappointment is the smudge tool, which creates a blend from a selected shape to a specified color. For some reason, you can't modify the number of steps in the smudged object the way you can in a blend.

Though FreeHand's Xtra tools all reside in a single palette, the Xtra commands are slightly less predictable. Some appear only in the Xtras menu, others appear both in the Xtras menu and as buttons in the Operations palette. This duplication wouldn't matter if FreeHand 5 didn't mix in a few non-Xtras just to make life confusing. The Blend command, for example, is now available as a command in the Path Operations submenu, as a button in the Operations palette, and as yet another command under the Xtras menu—and it's not even an external module; it's built into the FreeHand application. I suppose the intention is to make Blend (and ten similarly thrice-featured non-Xtras in the program) easier to find, but in practice it makes the program bulkier and harder to navigate. Microsoft Word and Excel also duplicate commands as buttons, but in those programs you can customize the buttons to fit your work habits, something I wish FreeHand offered.

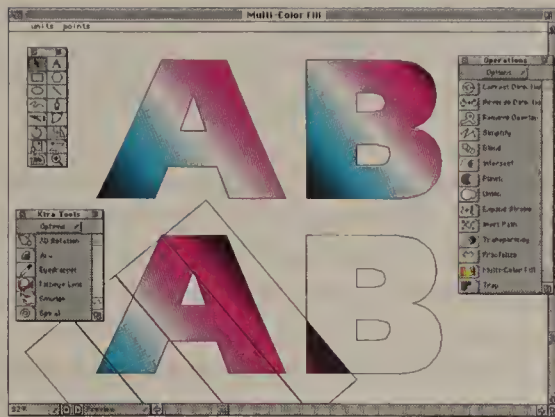
Color Me Pleased as Punch

FreeHand 5 includes several new fill and stroke functions that handily outperform their Illustrator counterparts. For example, the Xtra eyedropper tool lifts colors from objects as well as from imported TIFF images. This means you can create entire color libraries from a single 24-bit photograph. Illustrator imports EPS images only, and neither it nor FreeHand can lift colors from this format.

FreeHand's attribute styles have been modified so you can define styles that affect just the fill, just the stroke, or both. This is the first time since FreeHand 2 that you can name fills and strokes independently. If styles aren't your bag, you can simply copy the fill and stroke attributes from one object and use keyboard shortcuts to immediately apply them to another object.

FreeHand now automatically names colors when you add them to the Color List palette. And if you find dragging colors is too much work, you can choose Name All Colors, a helpful Xtra, to name and list all colors applied to objects in your document.

Finally, FreeHand 5's Color Controls dialog box lets you adjust the colors applied to selected objects. For example, to convert a full-color drawing to gray scale, just decrease the Saturation setting to 0. You can also tint objects, lighten or



Gradient Breakdown When you apply the Multi-Color Fill function to two independent objects, as in the case of the letters A and B at the top of the screen, the gradient fills each object separately. To make a gradient flow across multiple objects in FreeHand, you join the objects. But if you join objects filled with multicolor gradients, the fill doesn't flow properly, as shown at bottom. This is because the multicolor gradient is actually several rectangles filled with two-color gradients and pasted inside the letters. (I've drawn in the outlines for the rectangles so you can better see what's going on.) To remedy this, reapply Multi-Color Fill.

darken them, and displace colors around the hue wheel. When you're finished, you can turn around and automatically add your new colors to the Color List palette. This is the first time I've seen a color-manipulation command like this outside an image-editing application.

If all of FreeHand were this good, I'd have no complaints. Unfortunately, one color Xtra, Multi-Color Fill, falls short of the mark. Although it lets you assign gradient fills with as many as 64 key colors—Illustrator limits you to 32—Multi-Color Fill leaves a lot to be desired. For starters, the feature isn't integrated into FreeHand's existing two-color gradient function. This means you can't drag and drop colors into a multicolor gradient or lift colors with the eyedropper tool. In fact, a multicolor gradient isn't a true fill at all. The gradient doesn't update to accommodate reshaped or joined paths (see "Gradient Breakdown"). Also, you can't transform the object independently of its fill without first ungrouping, and the gradient replaces any objects previously pasted inside the mask without warning. Finally, you can't name multicolor gradients, as you can in Illustrator, nor can you copy them from one object and apply them to another.

Type on the March

FreeHand's type-specification options are still scattered throughout two palettes and several panels as before, but now you can bypass these controls by establishing fully functioning paragraph styles, like those in a word processor. When you edit a style sheet, FreeHand presents you with all character and paragraph attributes—

typeface, leading, tabs, paragraph spacing, even color—inside a single dialog box. As in FreeHand 4, you can apply style sheets either by selecting the text and then a style, or by dragging a style and dropping it onto any text in the document, whether selected or not.

FreeHand 5 also provides a spelling checker and a search-and-replace function. You can't search by style or automatically replace straight quotes with curly ones and make other "smart" punctuation adjustments, as in Illustrator 5.5. But I think most FreeHand users will manage to forgive these oversights when they find they can now hide and display the text ruler. Personally, I prefer Illustrator's free-floating tab ruler—which you can stretch and move at will, and which provides drop-down lines to more clearly demonstrate alignment—but FreeHand 5 is alone in offering tab leaders (as well as the wrapping tab stop introduced in FreeHand 4). Though I'd still like to see master pages and automatic page numbering, most users will likely prefer FreeHand over either PageMaker or QuarkXPress for creating small, design-intensive documents.

There's much more to praise in the new FreeHand. I haven't mentioned how you can magnify a drawing to a scale of 256 to 1, close enough to see the sweat on a fly. Nor have I mentioned how you can option-drag to clone objects, even while scaling or rotating; slice objects in free-form swipes with the knife tool; or hide and display palettes from the keyboard. You can also position objects on the Guide layer to serve as custom guides, though you can't reshape them while they're in the guide layer, nor can composite paths serve as guides, both disadvantages when compared with Illustrator. Meanwhile, the new trapping Xtra functions almost exactly like Illustrator's.

The Last Word

All in all, this is the most impressive FreeHand to date. Granted, its interface needs some restructuring, and a few Xtras feel as if they were thrown in to help bolster a features list. And Illustrator 5.5 still provides better gradients, mask editing, custom guide control, scaling and rotating, graphing, and screen management. But FreeHand is the faster program—especially when it comes to text and Xtras—and it wins in the key areas of navigation, object blending, schematic drawing, color management, text handling, small-document creation, and special effects. In fact—and it's been a long time since I've been able to say this—if I had to recommend only one draw program, it would be FreeHand.—DEKE MCCLELLAND

Stylus Color

Color Ink-Jet Printer

PROS: Excellent output quality. **CONS:** Slow when printing at 720 dpi. **COMPANY:** Epson America (310/782-0770). **LIST PRICE:** \$699.



THE STYLUS COLOR PRINTER IS Epson's entry into the rapidly expanding color ink-jet market until now dominated by Hewlett-Packard and, to a lesser degree, Apple. However, this late-comer, with its excellent output quality and reasonable price, should be able to pry many potential customers away from Apple and HP.

The printer's PC origins are obvious at first glance: the front panel offers one selection button for fonts such as Courier and Roman T, and another for economy or condensed mode—neither is a common feature on Macintosh printers. However, the printer also supports both parallel and serial printing (unlike the printers from Apple and HP); both ports are active simultaneously, and Mac and Windows software is included.

The Stylus Color currently supports QuickDraw only in 68000 mode, but a QuickDraw GX driver and native Power Mac support should be ready soon. A third-party developer is working on a software-based PostScript driver.

If you need to attach the printer to a network, an AppleTalk option is available for an additional \$149. This is definitely on the expensive side, since the HP DeskWriter 560C has built-in LocalTalk support, and the Apple Color StyleWriter 2400 can be shared via a host machine (these printers are in the same price range as the Epson; for more on the 2400, see *Reviews*, April 1995). Most people, however, won't want to use the Stylus Color over a network because it's just too slow.

Setup and Speed

Setup of the Stylus Color is straightforward. The toughest part is snapping the two ink cartridges—one for black, one for color—into place. It took me less than ten minutes total from pulling the printer out of the box to printing my first document. The manuals, especially the one for Macintosh users, are easy to follow.

Like the DeskWriter 560C, the Stylus Color uses a single color cartridge that holds three inks. The problem with this approach—although manufacturers may claim otherwise—is that it's extremely unlikely that you'll use up all three colors at the same time. When you finish one color, you have to replace the whole color cartridge (\$35; \$17 for the black cartridge), even if you have plenty of ink left in the other two colors.

While setup takes only a short time, printing takes forever. In 720-dpi-resolution mode, the Stylus Color was easily one of the slowest color ink-jet printers Macworld Lab has ever tested. One of our test documents, a 4-page Adobe Page-

much faster, although not as fast as the speedy Apple Color StyleWriter 2400.

Beautiful Output

The consolation for enduring slow printing is excellent output. At 720 dpi, gradients are smooth, colors vibrant, and details exceptional. The sharp, crisp text is notable for the lack of splattering (minute dots of inks around the characters). According to Epson, the use of piezoelectric print heads allows finer resolution and better control over splattering. For now, the Stylus Color is the ink-jet to beat in terms of image quality.

To get 720 dpi, however, you need Epson's special coated paper, which costs \$25 for 200 sheets. Using plain paper, you get output limited to 360 dpi. And although the printer supports legal-size paper, you won't be able to print the 8½-by-14-inch format in 720 dpi because Epson doesn't sell its coated paper in legal size. Even at 360 dpi, though, the output looks better than that provided by the HP or the Apple printer. Transparency printouts are limited to 360 dpi.

Although the Stylus Color outputs color well, it would benefit from a color-management scheme. Unlike Apple's and Hewlett-Packard's, the Stylus Color's software has no built-in color management. The Stylus Color software for Windows, though, includes gamma correction for each color, a preview of color-corrected output, and plenty of dithering patterns to choose from. Epson says it might incorporate these features into future versions. Even without color correction, the Stylus Color prints better than its rivals.

The Last Word

Despite the Stylus Color's shortcomings, Epson has built an ink-jet with superb output quality. I highly recommend this printer for anyone who needs excellent output on a small budget.—MARK HURLLOW



RICHARD RETHMEYER

Maker newsletter, took more than 1½ hours to print—an hour or so more than the DeskWriter 560C needed. The reason for this slowdown is the massive amount of data generated for the print. Mathematically, a 720-dpi file represents four times the data of a 360-dpi image. Of course, pushing this huge amount of data through the slow serial port doesn't help. At 360 dpi, the Stylus Color prints



How Fast Is the Epson Stylus Color?

■ Best result for each test. Times are in seconds. Shorter bars are better. All machines tested in best mode.

	PostScript Graphic	Object-Oriented Graphic	Photoshop RGB	Page-Layout Document	Presentation-Graphic Transparency
Apple Color StyleWriter 2400 (360 dpi)	532	609	512	610	599
Epson Stylus Color (360 dpi)	601	488	706	924	871
HP DeskWriter 560C (300 dpi)	763	547	882	1419	1075
Epson Stylus Color (720 dpi)	1908	1045	2477	5682	*

*Doesn't support 720-dpi transparency printing.

Presenter Professional 3.0

3-D Multimedia Tool

PROS: Integrated 3-D sound; improved animation controls; excellent modeling tools.

CONS: Import/export and Phong-shading functions not yet implemented. **COMPANY:**

VIDI (818/358-3936). **LIST PRICE:** \$1995.



PRESENTER PROFESSIONAL, the oldest living Macintosh 3-D modeling, rendering, and animation package, was showing its age. In comparison with younger, flashier offerings, it looked staid and felt a little awkward. But no more. Presenter Professional 3.0 not only holds its own in an increasingly competitive 3-D market, it breaks new ground by integrating audio into its 3-D design environment. Presenter Professional 3.0 has brought talkies to the world of 3-D animation.

In addition, Presenter Professional 3.0 has been completely rewritten. It's now native for the Power Mac, as well as compatible with 680X0 machines. Plus, it incorporates plug-ins, letting you add modeling tools, rendering engines, and animation routines. The program's once-weak animation component has been strengthened by more-precise controls. General interface improvements provide a clearer, more understandable workspace and better access to object information in both the modeler and animation modules. And the price has been reduced to \$1995 (the modeler alone used to cost that), so Presenter Professional 3.0 is a better value, too.

Sound Investment

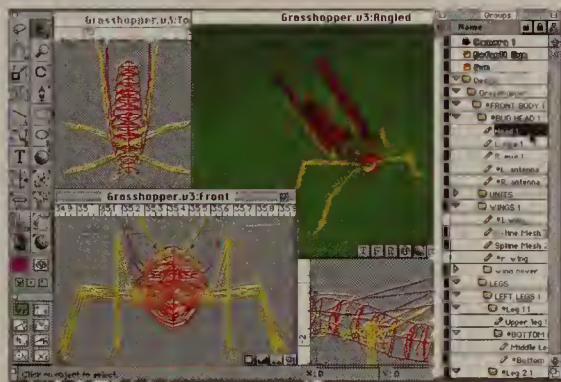
Usually sound is added to animations in postproduction, where rendered models are composited with backgrounds and the finished frames are combined with audio tracks. However, with Presenter Pro 3.0, sound is just another element in the 3-D scene. You attach sounds to an object by dragging them into the object's information dialog box, just as you would a texture or a color attribute.

To hear the sounds, you place microphones in proximity to the objects that produce them. Microphones can be located anywhere in the 3-D scene, and you can calibrate their sensitivity to make their hearing more or less selective. For example, a mike could be set to pick up only the sound of a nearby object, or its

range extended to include some background noise as well. Careful deployment of microphones can produce subtle effects, such as approaching footsteps.

Integrating sound into the 3-D environment is a wonderful idea. Professional animators and multimedia producers will appreciate the ability to hear aural effects at the same time they preview object motion, letting them correct synchronization problems on the spot.

VIDI has also improved Presenter Pro 3.0's lighting options. New settings let you adjust a light's intensity, permitting more subtle shadows and brightness-falloff effects. And a new projector light lets you shine PICT images and QuickTime movies on the surface of 3-D



New Look and Feel Interface improvements give Presenter Professional 3.0 a well-conceived and logically implemented modeling environment.

objects. Rather than simply displaying images on a surface, the program actually projects the image—so objects passing in front interrupt the beam, like people standing in front of a movie screen.

New animation plug-ins provide spline-path controls for object motion and apply the laws of physics to animated objects, to suggest the effects of gravity, wind, and collisions. And you can fine-tune the behavior of every object, camera, and light by adjusting its individual velocity graph, for smooth motion transitions.

A new time-line script window puts all this animation power together. In this window every element in the production can be addressed and controlled individually. You can double-click on an object's name to access its information dialog box for adjusting attributes. (You can also access the dialog by double-clicking on the object itself.) All in all, Presenter Professional has been transformed into a very competent animator.

Sound Modeler

Presenter Professional's excellent 3-D modeler is spline-based, so it lets you edit

shapes by pushing or tugging on their vertices as if working with clay. In addition, Presenter Pro can now perform Boolean (union, difference, and intersect) functions. The program calculates the interaction of meshed surfaces to produce a new meshed object, letting you use one object to carve another.

The program comes with rendering engines for ray tracing and for producing stereograms, those "hidden 3-D" images that have become so popular. Now a plug-in, the ray tracer has been rewritten and optimized, so rendering is faster than in previous versions. The program's excellent MacRenderMan interface, which lets you apply and manipulate RenderMan shaders, has been retained, and VIDI plans to include a Phong renderer in the future.

Presenter Pro 3.0's documentation is improved over that of previous versions. Separate manuals for the modeler and presenter modules provide reference sections and a series of simple tutorials. These manuals are better organized and more concise than were the old documents, but they still only scratch the surface. Novices should expect to spend some time working through both volumes. As you gain expertise, you can graduate to the *Human Model Super-Tutorial*, an extensive modeling exercise covering the creation of a human figure. This tutorial is a great addition that offers a rare, step-by-step introduction to constructing a complex model.

Presenter Pro 3.0 has made great strides, but it's not completely finished. In addition to the missing Phong renderer, import/export functions are not yet implemented, and the projected light source didn't work with the ray-trace renderer. So more work needs to be done (VIDI has announced a 3.1 upgrade, which should be shipping by the time you read this).

The Last Word

Presenter Professional 3.0 is a notable improvement over its predecessors. Excellent modeling and rendering capabilities are now complemented by well-conceived, professional-level animation tools. And it integrates sound, something no other 3-D program does—on any platform. Presenter Professional 3.0 is still at the high end of the price spectrum, but professional animators and multimedia producers will probably find it a bargain.

—CARLOS DOMINGO MARTINEZ

PaperPort

Desktop Scanner

PROS: Compact device; self-launching image software; document-management and -annotation tools; built-in OCR and printer importing; links to fax and text applications. **CONS:** None. **COMPANY:** Visioneer (415/812-6400). **LIST PRICE:** \$399.



LOSE YOUR EYES AND IMAGINE A magic slot located conveniently behind your keyboard. When you feed papers into it—magazine clippings, letters, invoices, business cards—their images are captured immediately to your Mac's hard disk. Now, imagine further that moments after you feed a document into the slot its image appears on the Mac's desktop, along with other images of other captured papers; you can arrange, sort, stack, annotate, optically recognize (as in OCR), print, fax, and E-mail these files just as you would normally do with the originals. Finally, cast yourself three months into the future, when you quickly retrieve one of these images by a keyword search and send it as E-mail to a colleague. You've now imagined Visioneer's PaperPort.

Smart Concept Made Real

The PaperPort is a very clever combination of elegant hardware and intelligent software that helps you electronically capture, store, annotate, retrieve, fax, and print all those odd bits of paper that clutter your life. Its "magic slot" is a compact 300-dpi scanner, about the size of a roll of aluminum foil, that sits between your keyboard and monitor. Installation consists of connecting the scanner to a Mac serial port, plugging in its power supply, and loading the accompanying software. A superb, well-illustrated, and well-indexed manual explains the process and all of the PaperPort's many software features.

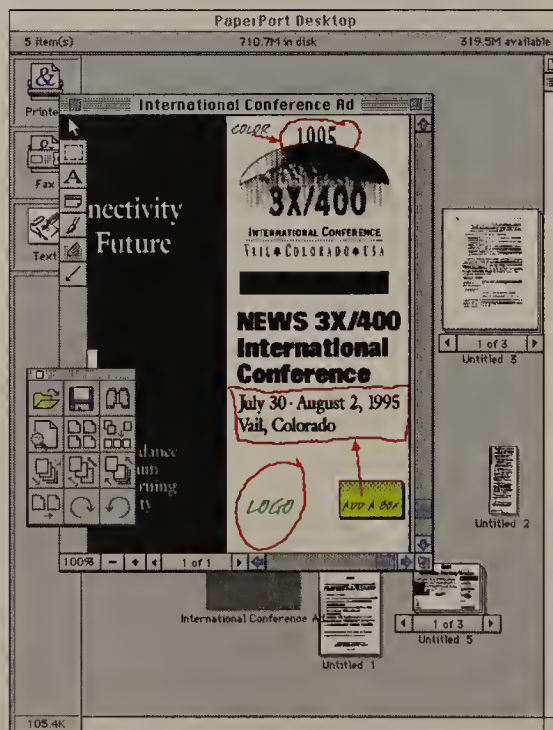
The PaperPort is engineered to be both convenient and unobtrusive. The scanner itself has no power switch; instead, it switches on whenever you insert something in the slot and accepts paper from 2 to 8½ inches wide and from 3 to 30 inches long. Ordinarily you feed pages through a lower slot and they make a 180-degree turn to emerge from an upper slot, but a slight twist of the scanner's housing redirects its paper path from curved to straight to enable you to

scan less flexible items. And the device performs impressively fast, scanning an average business letter in less than ten seconds.

Magic In, Magic Out

The PaperPort's software is every bit as ingenious as the scanning unit. Inserting a document brings an image window immediately onto your screen, allowing you to monitor scanning progress. When the scan finishes, the PaperPort application automatically launches, displaying the PaperPort's desktop window containing thumbnail images of all your scanned documents. The software can automatically crop and straighten images as needed, and you can select 200-dpi, 400-dpi, and photo-half-tone scan modes.

The desktop window lets you manipulate images just as you would papers on your real desk, sliding them into orderly arrangements or piling them up in stacks as you see fit. From the desktop you can save images and stacks to disk, annotate them, print or fax them, and even run them through OCR software and open the resulting text in your favorite word processor. The PaperPort's compressed image format stores an average 8½-by-11-inch page of text in about 20K, but you can also save in BMP, PCX, PICT, and TIFF formats.



Marking and Filing The PaperPort's document-management application lets you organize pages—scanned in via the PaperPort, imported from applications, or faxed in—as stacks. You can then annotate pages with sticky notes, graphics, lines, arrows, and text. The results can be saved, printed, or faxed elsewhere for further work.



KEVIN CANDLAND

The PaperPort has tools for annotating documents using sticky notes, text, lines, and arrows; and you can change the font, size, and color of any annotation. A Find File feature lets you search the contents of archived images for specific sticky notes and textual annotations, providing a powerful retrieval tool.

The left side of the PaperPort's desktop contains several Application Link icons, which give you drag-and-drop access to printing, faxing, E-mail, and OCR. Visioneer bundles in Calera Recognition Systems' WordScan OCR software, but you can also use Caere's OmniPage and Xerox Imaging Systems' TextBridge OCR products. WordScan has reasonable recognition rates and some advanced features, such as decolumnizing. For high-volume OCR, though, you're better off with the speedier add-on OCR packages.

The PaperPort provides fax-software links for Global Village Communication's Global Fax, Faxstf from STF Technologies, Apple Express Fax, and Delrina Fax-Pro. Visioneer bundles E-mail links for Lotus cc:Mail and CE Software Quick-Mail with the PaperPort; you can buy a \$49 upgrade for Microsoft Mail and Apple PowerTalk. The PaperPort Writer printing extension lets you print documents from applications directly to the PaperPort's desktop. This feature also enables you to print incoming faxes into the PaperPort for OCR, annotation, and filing.

The Last Word

Remember when pundits used to promise us a paperless office? Visioneer's PaperPort actually puts on your desktop everything you need to make that dream a reality. It's an unusually well executed product, at a very reasonable price.

—MEL BECKMAN

Day-to-Day Organizer 1.0

Personal Information Manager

PROS: Modules are well integrated; excellent contact manager and outliner. **CONS:** Can't easily change recurring events; some bugs. **COMPANY:** Portfolio Software (802/434-6400). **LIST PRICE:** \$149.95.



DAY-TO-DAY ORGANIZER consists of an address-book manager, Day-to-Day Contacts; a scheduling program, Day-to-Day Calendar; and an outlining program, Day-to-Day Notepad. The package comes with a leather organizer in the popular six-ring format (the same size as Filofax and Day Runner pages). Organizer is single-user; you can't share your calendar or contact file with a workgroup.

Integration among the three programs is accomplished via Apple events and centers around an extension called Assist, which appears in all applications as a menu item next to the Help menu. From the Assist menu, you can launch any of the three Day-to-Day applications, and you can use Assist to find and create contacts or calendar items. Assist's hierarchical menu lets you add your most-frequently-accessed contacts and their telephone numbers. When you choose a contact and hold down the ⌘ key, Day-to-Day automatically dials the telephone number. Assist can also be used to display a list of today's events or the to-do list.

Most of the bugs I found in the Day-to-Day package were associated with Assist. Editing to-do or event items from Calendar via Assist did not work correctly; when I marked a to-do item as done, Assist flashed a "Saving" dialog box, but did not change the to-do item. Accessing the to-do list again showed the item as pending. Similarly, when I changed an event's priority using Assist, the change was not saved, though changing the event's time using Assist worked fine.

Data entry methods are not consistent among the different parts of Day-to-Day. For example, when you enter data using Contacts, the program automatically formats telephone numbers with parentheses and hyphens; however, when you enter data using Assist, you must format the numbers yourself.

Day-to-Day Calendar

Compared with competing programs such as Adobe's DateBook & Touch-

Base Pro Bundle or Now Software's Now Up-to-Date 3.0, Day-to-Day Calendar comes up short.

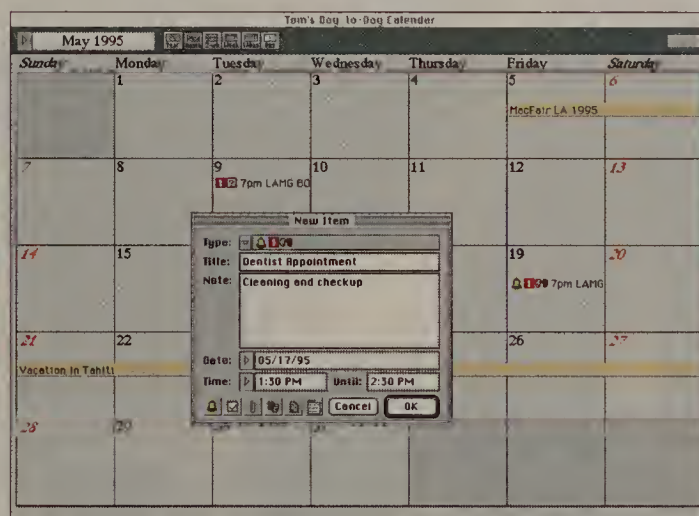
Calendar displays dates in one of six views (year, month, two-week, week, weekday, and day). As with almost all calendar programs, you can double-click on a date to create a new event or to-do item on that date, and you can drag items to a new date. You can create banners for events that span multiple days, and the program lets you use a variety of patterns and backgrounds.

Calendar's interface needs to be improved, as does the way it handles recurring events. Let's say that starting in January you have a meeting on the third Friday of every month. In March, the meeting date changes to Thursdays. You have to manually move the March

so topics on the same level are referred to as sister topics. Subtopics are daughters, and a topic at a level above a sister is known as an aunt. Each topic displays a triangle; double-clicking on a triangle shows or hides that topic's subtopics.

Notepad makes it easy to move and rearrange topics; when you drag a topic, its daughters move with it. Notepad allows you to paste graphics (PICT and bitmapped files) into topics, and you can attach sound files and voice notes to outline topics. Notepad allows you to use several different labeling schemes, including legal (1.1, 1.2, and so on), Harvard (IA, IIB, IIIC), and bullets. A particularly useful label is the check box, which makes Notepad great for to-do lists.

Notepad is integrated into the Day-to-Day system via Apple events. You can use Notepad to create detailed, time-stamped notes for a contact, or to create notes on an event or to-do item in Calendar. Any subsequent notes you create for that contact will add new headings, similarly time-stamped. Within Calendar, clicking on the Notepad button in an item's creation dialog box attaches a new Notepad document to that item. Notepad can also be launched from the Assist menu.



Little Icons The small icons that Day-to-Day Calendar uses sometimes obscure the description of an item; on the 19th, the meeting's description is almost completely crowded off the date by the multiple icons.

date and every subsequent date; Date-Book Pro, on the other hand, moves them for you. Calendar also requires too many extra steps to set up a to-do, and it doesn't let you set defaults for your most commonly used settings. So if, for example, you want your pending to-do's to always carry forward to the next day, sorry; you have to remember to set that option every time you make a to-do item. And the program's event icons often crowd the text description off the calendar.

Day-to-Day Notepad

Notepad is the latest version of a familiar outlining program that has seen several incarnations from multiple software publishers. The program has been known as Acta, Acta 7, Acta Advantage, and Dyno Notepad; under any name, it is an excellent, easy-to-use outliner. Notepad uses a family metaphor for outline topics,

Day-to-Day Contacts

Day-to-Day's contact manager has been well known as Dynodex. In fact, the Day-to-Day Contacts manual is the Dynodex 3.5 manual with a different cover.

Other than the name change, Contacts has changed little since *Macworld's* review in September 1994. The new version works with the Assist extension and with Calendar. The update is available in Portfolio's support forums on CompuServe and America Online. Contacts remains a strong single-user contact manager with excellent printing capabilities.

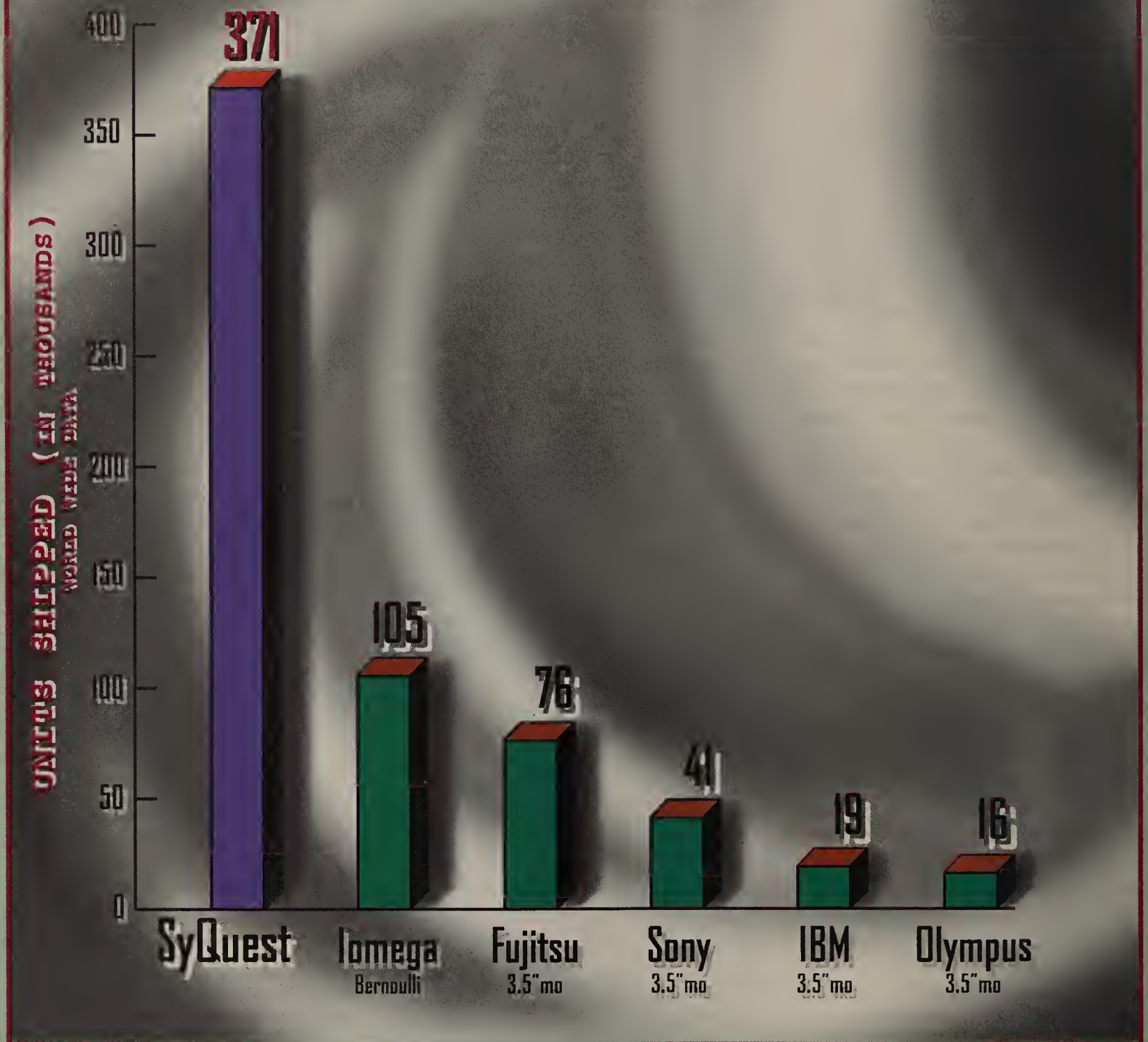
The Last Word

Day-to-Day Organizer is a mixed bag. Day-to-Day Contacts is a full-featured program, with enough features to satisfy even ardent PIM addicts. Day-to-Day Notepad is also an excellent organizational tool. But Calendar's interface and the way it handles recurring events need to be improved to make Organizer a competitive product.—TOM NEGRINO

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M.Y.O.B. 5.0

Accounting Software

PROS: Easy to set up and use; reports revenues and expenses by job; permits custom forms and reports; great features at an attractive price.

CONS: No multiuser capabilities; no tutorial.

COMPANY: BestWare (201/586-2200). **LIST**

PRICE: \$139; \$239 with payroll.



LOSE OUT YOUR SPREADSHEETS. Take the CPA off retainer. M.Y.O.B. makes double-entry accounting easy enough for anyone to do. Changing accounting systems is never easy, but switching to version 5 of this well-established program is worth a transitional headache or two.

M.Y.O.B. supplies integrated accounts receivable, accounts payable, inventory, and optional payroll for small businesses. Version 5 introduces improvements in system setup, data entry, and reporting. M.Y.O.B.'s file-folder-style interface is now even more convenient. A well-written start-up booklet and a brief instructional video (a real boon for those who can't bear to page through written documentation) throw in a bit of basic accounting for good measure.

Getting Started

Creating your chart of accounts and entering your opening balances is the most important—and unfortunately the most difficult—part of setting up an accounting system. Don't let this scare you away. M.Y.O.B. supplies predefined charts of accounts for 100 businesses from building contractors to graphic artists to veterinarians; one of these charts is likely to match your business's needs, but you can modify a chart or create one from scratch if need be. Note that M.Y.O.B. permits only four digits for your account codes—inadequate for some businesses.

M.Y.O.B.'s security system lets you control access down to the individual entry screen and report. You can permit viewing of the Payroll Summary Report but not allow access to the Payroll Activity Detail Report, for example, or you can let someone print checks but not create them. While many accountants prefer systems that require correcting entries be made, nonaccountants generally want the freedom to change entries at a later date. M.Y.O.B. is configurable to either permit or deny changes to saved transactions.

M.Y.O.B. handles day-to-day busi-

ness transactions easily, while complying fully with generally accepted accounting principles. You enter data via easy-to-use forms that are virtually identical to the customary checks, invoices, and other paper documents your business uses. Accounting jargon and double-entry screens are almost completely absent. You choose account codes from pop-up lists, and an Easy-Add feature lets you create new account codes as you enter transactions.

The program comes with four basic, customizable invoice formats. Like that ideal bookkeeper you always wanted to hire but could never find, M.Y.O.B. guards against accounting errors—checking for duplicate payments and purchase orders, and applying credits against outstanding bills. However, this vigilance slows data entry, especially when large data files are involved.

Payroll

M.Y.O.B.'s is one of the most complete, flexible payroll programs available in the price range. Not only can you assign each employee as many different wage categories and rates as you need (you're typically limited to three rates per person), but you can also assign each wage a different job code and general ledger account. The system easily handles commissions, tips, overtime, payroll advances, and deductions. M.Y.O.B. automatically calculates all payroll tax deductions and employer payroll taxes, provides reports for quarterly-tax preparation, and generates annual W-2 statements.

Reporting Capabilities

M.Y.O.B. provides a wide variety of management reports in addition to the standard financial statements your banker and accountant want to see. For example, using the Sales Analysis report you can analyze sales by product, by customer, or by salesperson—and you can include prior-year comparisons. The Cash Flow Projection report analyzes your receivables and payables and projects cash balances for any period you specify.

To help you manage your bottom line, the Item Price Analysis report details the current price, cost, gross margin, and markup percentage on your inventory items. On screen, the Zoom feature takes you from high-level summarized reports down to the individual transactions that make up the total, so you can understand the reasons behind the numbers. You can filter reports for time periods and data ranges and dress them up for presentation. Batch reporting allows you to issue a single command to print a set of reports that you customarily review at month-end, for example—a great time-saver.

Though M.Y.O.B.'s custom reporting is not quite as flexible as that of Intuit's QuickBooks, it's easy to use and provides all the information that most small-business owners will ever need. An important M.Y.O.B. feature is job reporting—measuring profit and loss on a project-by-project basis rather than for the organization as a whole. In version 5, this includes balance-sheet and income-statement accounts. Job codes used with balance-sheet accounts can simulate fund accounting for nonprofit organizations or provide separate reporting for branch locations within a single organization.

M.Y.O.B. 5 lacks multiuser capability. For now, networked users will have to queue up to perform their accounting tasks. Businesses cross-pollinated with Macs and PCs will be heartened to know that the package operates identically on both platforms, although their respective data files are not yet compatible.

Service and Support

Good technical support is critical for accounting programs, and M.Y.O.B. is up to the challenge. The manual is clear but occasionally lacks detail. For example, it's skimpy on how to use the payroll system and how to process accrual-basis transactions so they don't appear on cash-basis accounting reports. And though M.Y.O.B. ships with a set of sample data, it lacks a tutorial—a major oversight.



Streamlined Data Entry M.Y.O.B. shows you all functions related to a command center in one window. Pop-up lists make data entry easy.

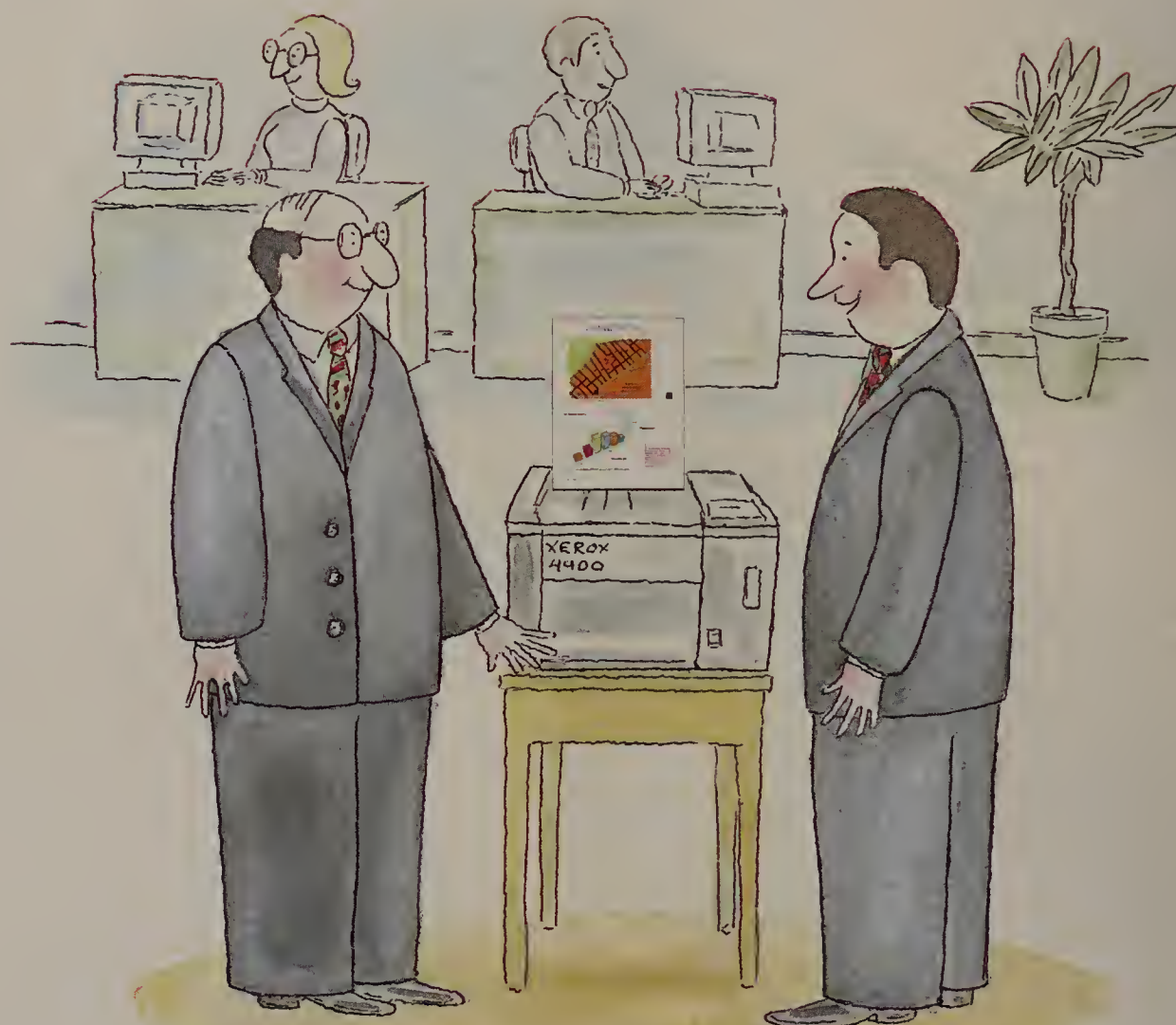
The on-screen help system is well organized and complete, and context-sensitive help is available on CD-ROM. M.Y.O.B.'s online forums receive prompt attention from technical support.

The Last Word

M.Y.O.B. makes double-entry accounting a viable choice for the small-business owner. It simplifies the bookkeeping and reporting process and offers many management-support and automation features—and the price is right. Accounting doesn't get much easier than this.

—JAN GILLESPIE

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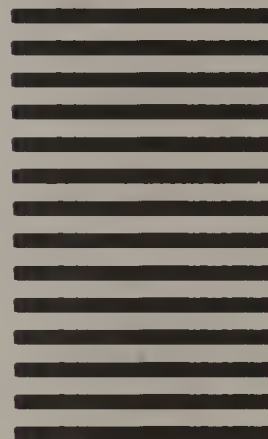
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Route 66 1.5

Route-Planning Program

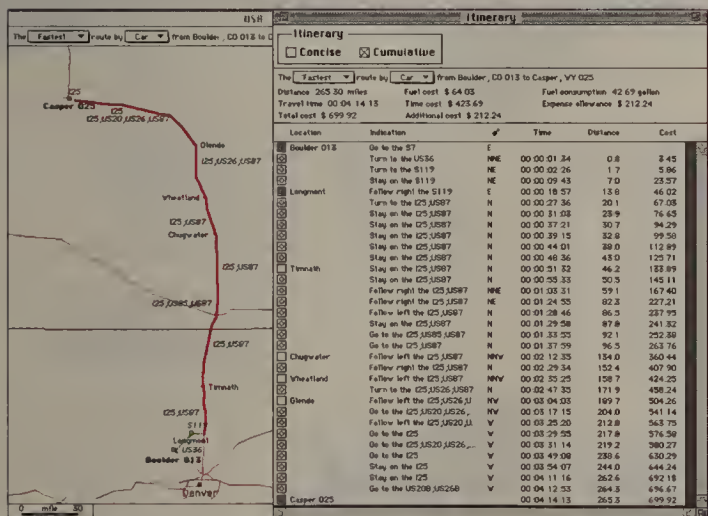
PROS: Fast; supports AppleScript. **CONS:**

Limited route options; can't find every U.S. town; can't calculate trips involving more than three cities. **COMPANY:** Route 66 Geographic Information Systems B.V. (415/957-0666). **LIST**

PRICE: \$79.95.



ROUTE 66 FINDS BOTH THE fastest and the shortest driving route between two cities. That's no big deal if the cities are San Francisco and New York (quick tip: don't drive, take a plane). But when you need to find your way from Phoenix to a town you've never visited, such as Bisbee, Arizona, Route 66 can tell you which way to go and how long it will take to get there.



Turn Here The map is nice, but it's the driving directions that make electronic route finders worth the money.

Using the program is easy. You tell Route 66 where your trip begins and ends by entering place names in a dialog box. After asking for either the quickest or the shortest route, you click on Find.

Route 66 searches its database of roads, trying to determine the best route for your journey. It draws a map, highlighting its recommended route, and creates written driving directions with estimated travel times and distances.

Route 66 includes an option to calculate bike routes. Unfortunately, the program couldn't find routes between cities I've ridden between, and many of the routes it did recommend were longer than necessary or traveled down roads I don't consider safe for bikes. For example, the program recommends a 222-mile route between Santa Cruz and Salinas, California—towns only 40 miles apart.

Route 66 couldn't find better bike

routes because it and similar programs list only county roads, highways, and freeways, not every street in the country. For traveling by car, Route 66 will get you to a town's limits but won't get you to a specific street address. You don't use programs like this to find your way from an airport to a nearby hotel, but to calculate routes between cities.

When I travel by car, I sometimes need to visit several cities during the same trip. Route 66 can only calculate trips including three cities. The similar Automap Road Atlas (see *Reviews*, July 1994) can handle six. Worse, Route 66's U.S. map didn't list all the towns I looked for (for example, Austin, Nevada; Cornucopia, Wisconsin; and the entire state of Alaska were missing). The company says its current U.S. database includes 13,000 towns and cities. In contrast, Automap claims its database includes 120,000 locations. Route 66's database doesn't include national parks or other recreational destinations. And while you can buy maps for much of Europe, you can't buy maps of Canada or Mexico.

The program runs native on Power Macs and is fast on a 25MHz 040 Quadra 700. Route 66 doesn't suffer from the slow screen redraw of Automap Road Atlas. But like Automap, Route 66 displays only one route at a time. You can't simultaneously view different routes on your screen.

The program's extensive, well-documented support for AppleScript means that you could build scripts to access Route 66's features through other programs such as Excel or FileMaker. But I'm not sure

Route 66's database is up to the task.

The company plans to offer registered owners a free upgraded database during the first half of 1995. Future plans beyond that include optional detailed maps for specific cities and metro areas. These improvements will be welcomed.

The Last Word

Route 66 is fast. But since I spend more time reading maps than creating them, I need more than speed. I need flexibility and detail, and Route 66 doesn't provide them. The program can guide me between big towns like Philadelphia and Pittsburgh. But it can't show me how to drive to some smaller towns like Trexler-town, Pennsylvania.

There's a lot to like about Route 66. But until its database is more complete, Automap Road Atlas, though slower, is a better buy.—JIM FEELEY

Virex 5.5.1

Virus-Detection Utility

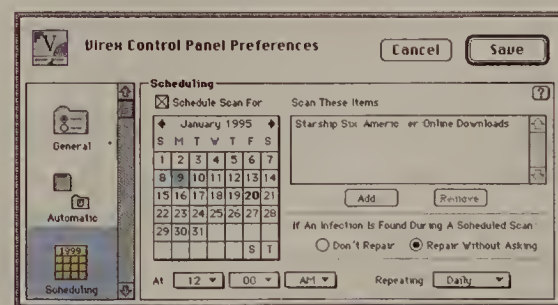
PROS: Extremely fast virus scans, especially on a Power Mac; easy detection-string updating; scheduled scanning feature. **CONS:** Expensive automatic update service; weak password protection. **COMPANY:** Datawatch Corporation (508/988-9700). **LIST PRICE:** \$99.95.



THE EVER-PRESENT POSSIBILITY of being infected by a computer virus was recently brought home with the news that some Macintosh users had lost the ability to type vowels on their computers. This sort of mischief is why it's important to have good, up-to-date virus-protection software, such as the latest version of Virex from Datawatch.

Virex 5.5.1 includes a control panel and an application; the latter works in native mode on a Power Mac or in 680X0 mode on your regular Mac. The installer lets you scan all of your available hard drives before installing the program, so you can quickly discover whether a virus is already present.

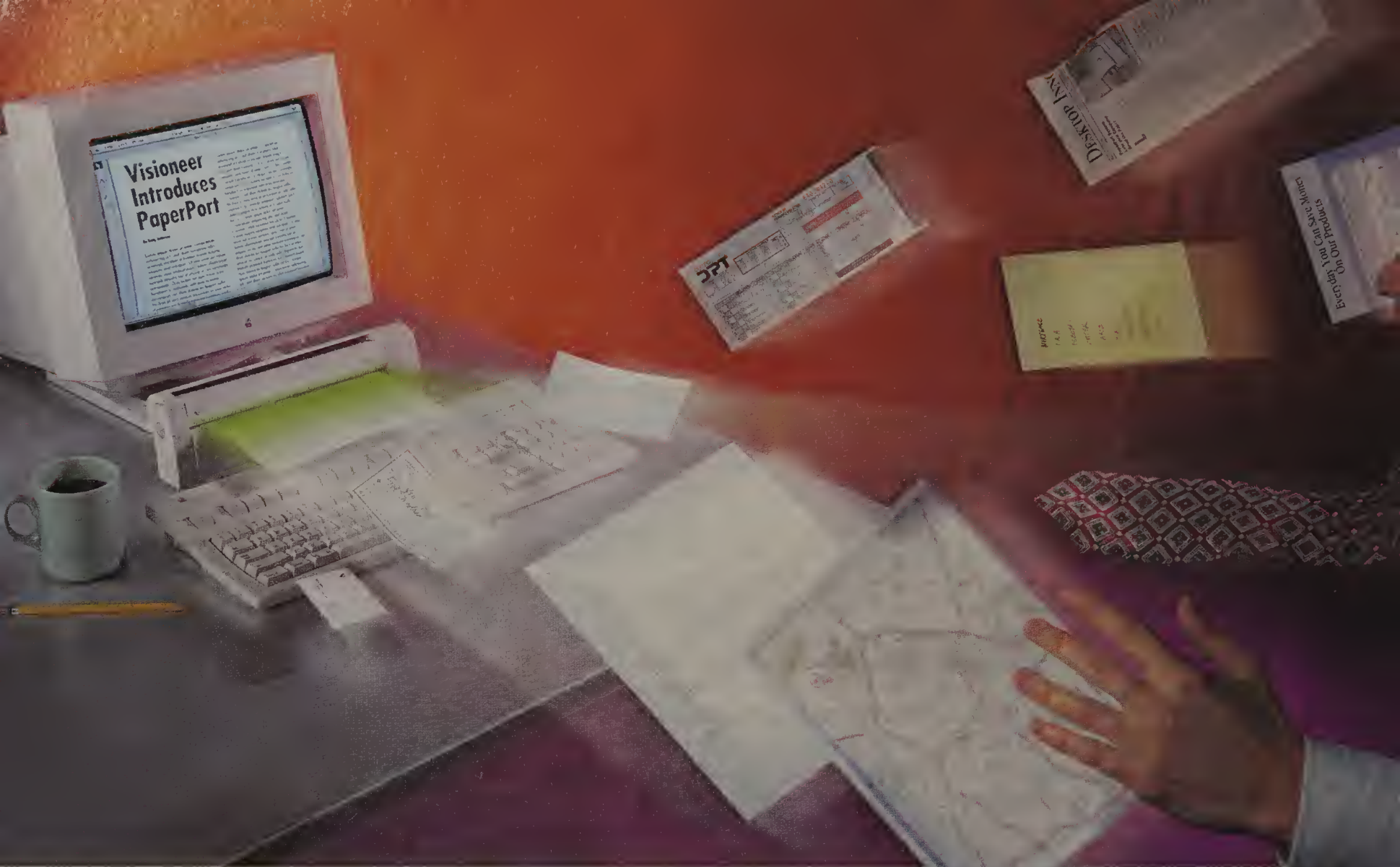
The Virex control panel gives you options as to what to scan and when. In default mode, it scans files as they are opened (when virus infection is apt to occur) and floppy disks after they are inserted in the drive. Additional options let you scan removable cartridges when they mount, schedule scans, and config-



Automated Virus Protection You can schedule Virex to check your Mac for viruses on a regular basis.

ure the alert messages Virex puts up if a virus is found. Virex can offer to repair an infected file, delete it, or copy it to another drive for a later repair attempt.

The new version of Virex lets you scan compressed files and simplifies the technique of adding new virus-detection strings to the program. Updating Virex is now a piece of cake. Datawatch uploads update files on major online services. You continues



PaperPort.™ The fastest way to get paper into your Mac.

If it's on paper,
it's PaperPort-able!

Okay, so you have no trouble getting paper out of your Mac. But what do you do with the articles, letters, receipts, and business cards—the important papers—that cross your desk every day? You use PaperPort, that's what! The first truly simple, super-small input device that converts your paper documents into electronic ones. **Always ready to go.** Just plug PaperPort into your Mac's printer or modem port and then feed in a piece of paper. PaperPort grabs the paper, scans it and launches the software automatically—there isn't even an ON button! **Instantly useful.** At six seconds per page, PaperPort begins to display your documents on the screen even before you're through entering them!

Fitting comfortably
between your keyboard
and monitor, PaperPort
becomes an integral part
of your desktop.

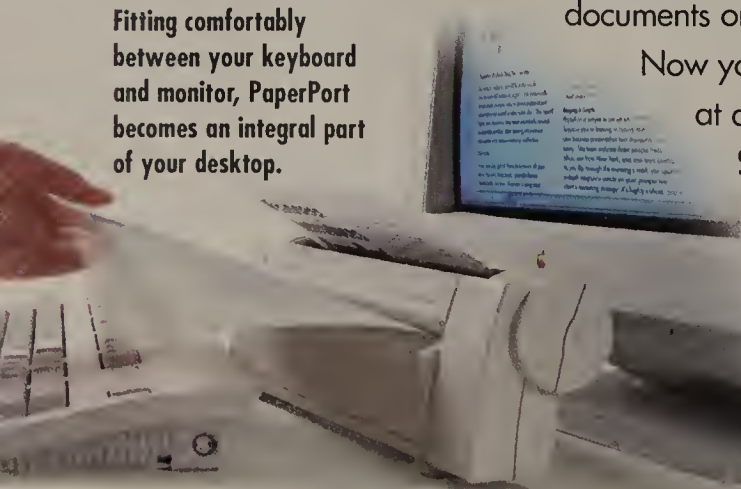
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one click will print it.
another will fax it. And a
third will OCR scan it.
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VISIONEER

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double-click on the update file, the Virex application launches, and the detection string is automatically updated (no importing and moving of files is necessary). For \$75 per year, you can subscribe to Datawatch's automatic update service and receive new disks with updated virus strings and maintenance updates to the program. This seems costly for software that sells for that amount at most mail-order houses; if you already subscribe to one of the major online services, you'll probably want to skip the update service.

Datawatch offers a special version of the program for network use, Virex Administrator, for \$200. I didn't test this version of the program.

With SpeedScan, the Virex program creates a reference file the first time you do a scan; it takes a few minutes to run for each drive. On subsequent checks, Virex uses the SpeedScan reference file to boost performance tremendously. On my Power Mac 8100/80, Virex zipped through three hard drives, with a total of over 4GB of storage space, in less than two minutes! Scanning the 320MB drive on my PowerBook 540c took 16 seconds.

In the past, virus-detection software has been notorious for slowing down your Mac. Every time you launched a program, you had to wait extra seconds for code resources to be examined to check for possible infections. But application launch times were only slightly slower with Virex running.

The built-in help is probably more than enough to get you up to speed with Virex; the brief, well-written manual should take you the rest of the way. When problems occur, Datawatch offers free technical support via a toll call. But you probably won't need much technical support. During my tests, Virex was as transparent in operation as virus-detection software can be and worked flawlessly and reliably. The only bug I've heard about affects users of the TrashBack extension of Symantec's MacTools 3.X. When Virex is running, the invisible folder TrashBack creates for invisible files becomes visible, but TrashBack is otherwise unaffected.

Password protection is offered, including the option to lock the Virex control panel in the System Folder. But restarting with extensions off is sufficient to disable the locking feature.

The Last Word

Even before native Power Mac software existed, Virex was fast. In Power Macintosh form, the program positively blazes when scanning your drives. Virex is a comprehensive, reliable virus-detection program that will definitely meet the needs of most users.—GENE STEINBERG

CanOpener 3.0

Finder Utility

PROS: Opens QuickTime, DOS, sound, and picture files; compact. **CONS:** Quirky file-search feature. **COMPANY:** Abbott Systems (914/747-4171). **LIST PRICE:** \$125.



EVER GET A DOCUMENT FROM A friend or online service, only to find that you don't have the application necessary to open it? Sure, you can get software that will play movies or open damaged files or open DOS files or ASCII files, but wouldn't it be nice to have all that in one product?

CanOpener, a 180K utility from Abbott Systems, opens practically everything: DOS files; sound files (SND, FSSD, Instrument formats); pictures in

requires that QuickTime be installed in your system in order to play movies.

Once a file is in the View Area, it's easy to use the Clipboard to cut and paste the file into a document created in your favorite application. I was able to respond to a coworker's plea for help—he needed Adobe's PageMaker to view a file—in literally seconds by opening the PageMaker file with CanOpener, copying and pasting it into Microsoft Word, and sending it to his desk over office E-mail.

I always found CanOpener to be quick with this open-copy-and-paste routine: a PC file that took MacLink Plus/Translators four minutes to convert to Word took CanOpener one. The drawback is that the CanOpener-converted file was text-only, while the MacLink Plus document retained its formatting. The CanOpener version also had a lot of junk text at the end of the file that the MacLink file did not. Tweaking the text-cleanup section in File Preferences helps eliminate random-character noise from a file.

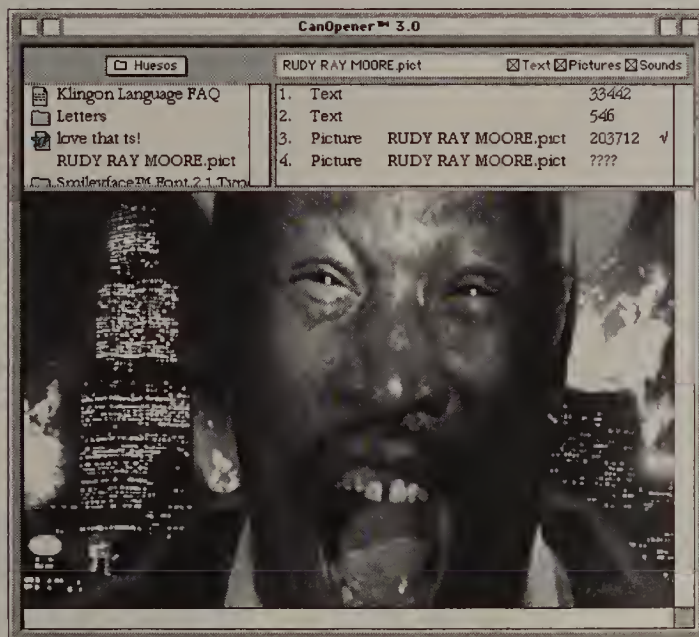
Abbott also promotes CanOpener as a text-and-file-search utility, but I encountered speed problems with this function. Searching text for a phrase in a particular folder was no problem. When I expanded the search to my entire hard drive, I waited and waited. After six minutes of watching the little can go round and round, I canceled the operation. It turns out CanOpener was searching not just my hard drive but all mountable file servers—yikes! I tried it again, with extensions off and no servers mounted; this time CanOpener brought up a dialog box to connect to the server and wouldn't let me cancel out. It was either search

the server or forget the whole thing.

My other complaints are few. The page-up and page-down keys work in the File List window, but not in the View Area window. Some of the key commands are not what I'd expect of a Mac program—⌘-P for View Preferences instead of Print, for instance. And ⌘-period (.) doesn't always stop the current operation.

The Last Word

There are specialized utilities for viewing graphics, movies, or DOS files, and for opening files when the application is unavailable. CanOpener opens them all, and if it doesn't work quite perfectly, it does work fast. For an all-in-one product with a street price of around \$60, it can't be beat.—SUZANNE COURTEAU



What Format? Who Cares? Whatever you've got, CanOpener can open it. You can copy to the Clipboard and paste text and graphics into your presentation, business plan, or report.

MacPaint, MacDraw II, PICT, EPS, ICON, and TIFF formats; damaged files; QuickTime movies; and ASCII-based text formats.

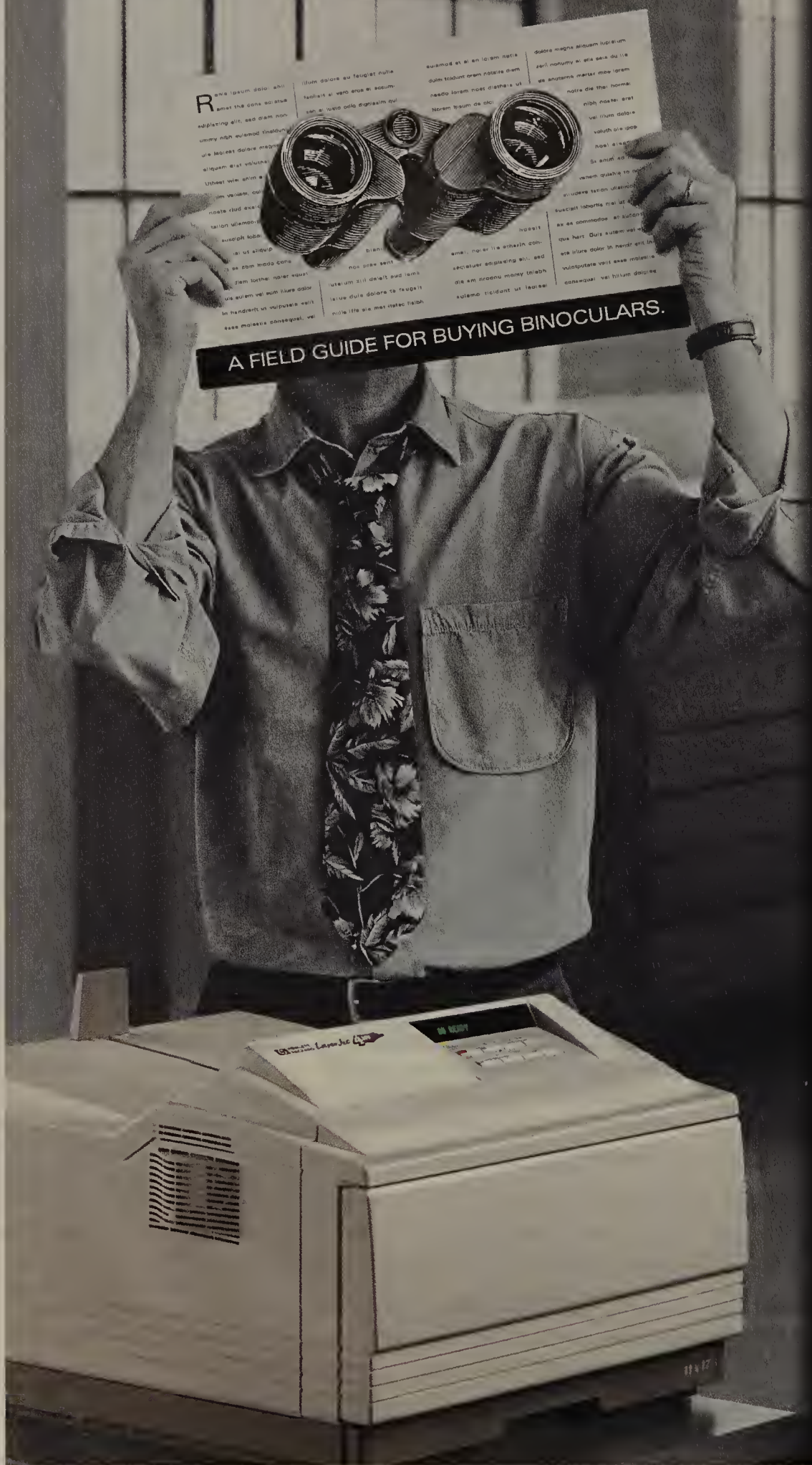
Opening CanOpener brings up a simple window divided into three sections: File List, Contents Area, and View Area. The File List shows mounted volumes; a pull-down menu lets you select individual volumes, folders, and files for searching or viewing. The Contents Area lists the text, pictures, or sounds associated with a selected file. Double-click on an item in the Contents Area to display it—or play it—in the View Area. In the case of QuickTime movies, a player with start, stop, volume, and frame-by-frame buttons appears; you then view the movie using CanOpener's player. CanOpener

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Netscape Navigator

World Wide Web Browser

PROS: Provides intuitive all-in-one Internet interface; optimized for 14.4-Kbps modems; available free to nonprofits; evaluation copies available online. **CONS:** Doesn't fully incorporate E-mail. **COMPANY:** Netscape Communications Corporation (415/528-2555). **LIST PRICE:** \$39.



NETSCAPE COMMUNICATIONS wants you to forget all the highway metaphors you've ever heard about the Internet. Instead, think about an encyclopedia—one with unlimited, graphically rich pages, connections to E-mail and files, and access to Internet newsgroups and online shopping.

Netscape Navigator is a World Wide Web-based client application for accessing Internet servers that speak the HyperText Markup Language. HTML, when seen through a Web client or browser, transforms the Internet's uninviting Unix look into an appealing and intuitive page format replete with sound, photo, and movie files.

But the real point of the Web is the way hypertext links can connect its pages. Web links are really pointers to Internet addresses or Universal Resource Locators (URLs); clicking on a link whisks you across the Internet to the server where that document resides. Web browsers let you jump on the Internet from a home page, which, loaded with hyperlinks to Web sites, acts like an interactive table of contents to the Internet.

Surfing with Navigator

Launching Navigator takes you to the Netscape Communications home page, where you can find a hyperlinked list of the latest and coolest Web sites, a searchable Internet directory, and updates from Netscape. When you find sites you like, you mark their pages in a bookmark list so you can return to them easily.

Navigator's well-designed built-in news reader lets you access Usenet message groups in page format. The HTML format lets readers jump to hot-linked newsgroups, provides buttons for easy posting and reading, and has simple subscribe/unsubscribe commands, all making it easy to navigate newsgroup threads.

Early Web browsers suffered from poor compatibility with File Transfer Protocol servers; Navigator rarely balks at retrieving FTP files. Still, because In-

ternet document standards change constantly, Navigator can't read every available file format. To get around this, Navigator supports helper applications that are widely available on the Net in the form of small (around 50K) players for letting you view video or hear sound files.

Navigator requires a direct Internet connection or a TCP/IP account from an Internet service provider. Accessing Web pages via a dial-up account is still fairly slow; Navigator is optimized for 14.4-Kbps modems and loads graphics incrementally while it displays text. Files don't load any faster, but allowing you to read ahead makes it feel that way.

Navigator's biggest omission is support for incoming E-mail. You can configure Navigator to let you respond to E-mailbox hot links within HTML pages, but you can't use it to receive, organize, or filter mail. If Navigator is to become *the* Internet interface, it has to incorporate E-mail more thoroughly.

Navigator is distributed free online for nonprofit, evaluation, or educational use, so why should you buy a copy? To get the excellent printed manual is one reason. It captures the voice of the Internet—irreverent, helpful, and a little geeky. Access to tech support is another good reason to pony up, and eventually security for commercial transactions con-



Armchair Traveler I used Navigator to download this map of the Paris Metro (<http://meteora.ucsd.edu:80/~norman/paris/>).

ducted online will be another. Right now only a handful of people use the Internet for buying and selling anything, but Netscape signed deals with credit card companies earlier this year and is almost certain to limit most security features to the commercial version of Navigator.

The Last Word

Navigator is well ahead of other Web browsers in terms of features, stability, and ease of use. If Netscape improves its E-mail features and puts security standards more firmly in place, Navigator will be even harder to unseat as the best vehicle for surfing the Internet.

—MATTHEW HAWN

QA-1500

LCD Panel

PROS: Excellent color quality; well-designed remote; lets you make computerless presentations. **CONS:** PCMCIA functions hard to use; expensive. **COMPANY:** Sharp Electronics Corporation (201/529-8731). **LIST PRICE:** \$5795.



SOME LCD MANUFACTURERS INCLUDE writing utensils or elaborate input devices, and others boast the ability to make presentations sans computer. The latter ability is the most distinguishing feature of Sharp's QA-1500.

The Sharp panel is an active matrix, video-capable LCD panel that offers excellent display quality and flicker-free video. At setup, the QA-1500 needed little adjusting; it displayed colors flawlessly. Flesh tones were accurate, and text looked crisp at a variety of sizes. When the unit displayed a solid color, however, the top of the image looked washed out, while the bottom looked more accurate. *Macworld's* overhead projector is generally dimmest in the upper-left and upper-right corners, so the QA-1500's occasionally excessive brightness can't be attributed to the projector. Video from a laser disc player appeared smooth and flicker-free when I played it on the LCD.

The included remote control has an illuminated display with easy-to-understand buttons and is one of the best I've used. The display lights up when you press a button on the remote.

Computerless Presentations

The QA-1500 has a PCMCIA slot that takes Type III storage cards. With the card in the panel, users can copy presentations created on the Mac and save them onto the PCMCIA (or PC) card. A saved presentation can then be displayed from the PC card, without using a Mac. The PCMCIA is an innovative plus—if you can get it to work. Sharp's manual does not explain exactly how to get your presentation from the Mac to the PC card. A technical-support staffer acknowledged the omission and explained that you first open the presentation on the Mac, then use the remote control to bring up Sharp's internal software on the QA-1500; the software lets you copy the presentation to the PC card one slide at a time.

Creating the presentation with Sharp's DOS-like commands is a two-step process: after saving the slides to the PC

continues

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card's directory, you assemble the presentation (the card stores a maximum of five presentations). You have to save and add each slide individually. You also have to name the slides using the remote control. You move through the alphabet using plus and minus buttons, similar to the way you enter your initials on an arcade-style video game—a tedious and time-consuming process. You can only control the PC card from the remote; you can't use the computer. But the remote is fairly large, and if, like me, you have small hands and need to set up a computerless presentation, the remote can become heavy and cumbersome.

Once your slides are assembled on the PC card, you disconnect your Macintosh and make your presentation. My panel-based presentation worked well, although moving from slide to slide took about a



KEVIN CANDLAND

second longer per slide than it did using my presentation software.

If you don't have a Mac available and you don't anticipate making last-minute changes to your presentation, the PC card option might appeal. I prefer the flexibility of using a computer.

The Last Word

The QA-1500 costs slightly more than other panels; the PCMCIA storage card costs an additional \$500. Sharp also sells a \$200 backlight that lets the LCD panel work as a stand-alone monitor. As a stand-alone display, the QA-1500 looks great from some angles and unreadable from others; as with PowerBook screens, you may need to adjust the angle from which you view the LCD screen.

Overall, the QA-1500 is a good product, but its value is partially eclipsed by the excellence of other—less expensive—products, such as those from Boxlight, nView, and Panelight Display Systems (see "Portable Presenters," January 1995, and "Panelight ZX," *Reviews*, March 1995). The QA-1500, however, has the PCMCIA card option and the Sharp name. But if you want a high-quality LCD panel without the frills, check out the less expensive products.

—JOANNA PEARLSTEIN

Electronic Marker 1.0.2

Presentation and Annotation Tool

PROS: Good variety of markup tools; numerous keyboard shortcuts. **CONS:** Can't toggle between markup mode and editing mode without clearing marks; no Undo command; can't remove unwanted markups without clearing entire markup layer. **COMPANY:** Consumer Technology Northwest (503/643-1662). **LIST PRICE:** \$34.95.



IMAGINE COVERING YOUR COMPUTER screen with a sheet of clear acetate and then drawing on the sheet with a felt-tip pen. That, in essence, is what you do with Electronic Marker. With this simple system extension, you can use your mouse (or another input device, such as a trackball or stylus) to highlight text and images on your Mac's screen, draw arrows and symbols to isolate specific points, mark proposed deletions, and so on; your markups are recorded on an invisible layer superimposed on your documents. You can mark up and annotate a screen to your heart's content while the original data remains untouched. Being able to draw on top of your screen data can be useful for training and presentation purposes, but the Electronic Marker software has a few weaknesses that make it a less practical tool than you might expect.

The program provides three types of markup tools, which you can customize through the Electronic Marker setup application. Marker tools let you draw solid lines. Highlight tools work like transparent highlighter pens. Image tools are small icons (check marks, arrows, happy faces, and the like) that you can paste on screen. The program's simple, one-window interface lets you fine-tune each tool. You can, for example, choose from eight pen thicknesses and several colors. You can constrain the Marker and Highlight pens to draw only horizontal and vertical lines. You can pick from 34 different images for the Image tools, but, unfortunately, you can't create your own images or edit existing ones.

To use any of the markup tools, you have to switch into markup mode by clicking in the lower left corner of the screen, or via a keyboard combination that you define. This essentially freezes your current screen image and lets you begin using the markup tools

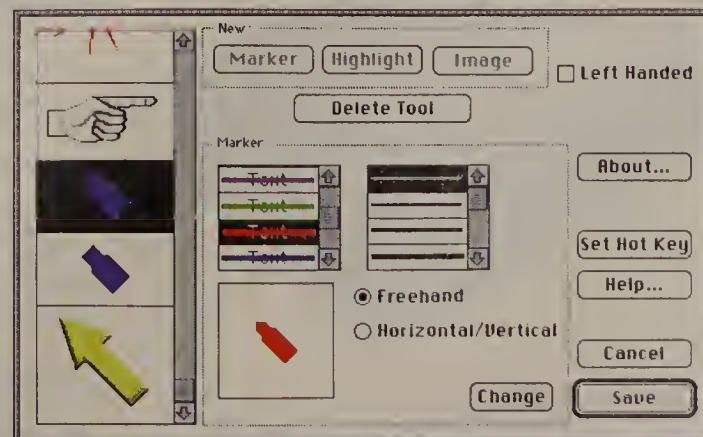
you have set up using the Electronic Marker application. The program includes plenty of convenient keyboard shortcuts for switching pen colors and types as you work.

Here's the problem: you can't toggle between markup mode and normal mode without obliterating the markup layer. If you exit markup mode—to open another document, for example—all your annotations disappear forever. This means you can mark up only a single screen at a time; even scrolling to the next page of a document erases your marks. The only way to capture your markups permanently is to do a standard screen capture using the Mac's built-in picture-taking command, ⌘-shift-3. (This doesn't seem to work on every Macintosh, or with every keyboard, however; I was unable to make a screen capture of marked-up pages on a Quadra 630.) So, while Electronic Marker can be a practical enhancement to live demonstrations and on-screen presentations, it's not necessarily the best tool for annotating documents that need further editing.

The markup program has other irritating limitations. There's no Undo command. Worse, there's no way to erase individual symbols or markups once you've applied them. So, if you accidentally add a stray mark to a document—even a single errant mouse-click is all it takes—you either have to live with the unwanted mark or start over.

The Last Word

The concept behind Electronic Marker is wonderful, but the software is limited and too ungainly to be really useful for many tasks. It can genuinely enhance on-screen presentations and training sessions with its colorful markup notes and symbols, but the program needs better controls for modifying and preserving markup layers to become an appealing tool for annotation.—JOSEPH SCHORR



On Your Mark Electronic Marker lets you preset up to eight different markers, highlighters, and images, all of which you can instantly access through keyboard shortcuts.

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Atlases

World Globe Software

3D Atlas 1.1

PROS: Beautiful, spinnable, zoomable globe; click-a-country, see-a-slide-show feature; 50 environmental movies. **CONS:** Globe doesn't spin freely in all directions; small window; a few typos and mispronunciations. **COMPANY:** EA World (415/571-7171). **LIST PRICE:** \$79.95.



Small Blue Planet 2.0

PROS: Gorgeous satellite photography; new click-a-country, hear-the-language feature. **CONS:** Slow; distracting blotchiness when a new region is viewed; no manual; cryptic interface. **COMPANY:** Now What? Software (415/885-1689). **LIST PRICE:** \$59.95.

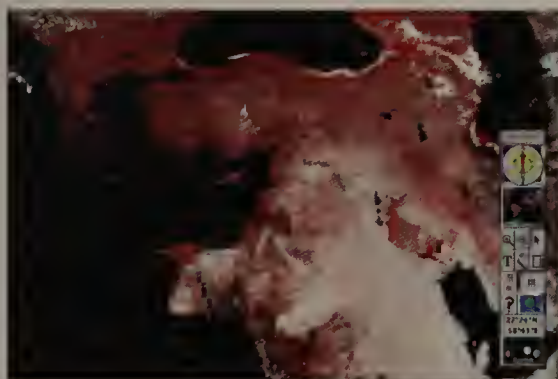


CARTOGRAPHERS HAVE STRUGGLED to depict the globe on a flat surface. If you simply flatten the sphere, the map is distorted. Small Blue Planet and 3D Atlas use multimedia to depict the globe on the flat surface of your monitor.

Small Blue Planet

As in its original version, at Small Blue Planet 2.0's heart are six dazzling photo-mosaics created from satellite shots of the earth's surface (see *Reviews*, July 1994). Version 2.0's new feature is sound: you can click on any of 70 countries to hear, pronounced in the native tongue, "Good morning," "I love you," or another phrase. It is written out in the appropriate alphabet. It's fantastic.

Unfortunately, many of version 1.2.1's shortcomings remain. The political map is still barren, showing only country boundaries and capitals—and a typographically disastrous information window covers up a third of the screen.



Caught in the Act After a zoom-in, the upper-left of the screen is in normal high-res mode, while the lower-right half has yet to be redrawn.

Also, when you scroll (in any of the modes), you see a blotchy patchwork of crude squares. If you're patient, the program repaints the quiltlike area until the whole screen shows high resolution. But you can't resize the full-screen window.

Small Blue Planet is further diminished by its tool palette, whose mysterious little icons have no labels. Neither the company's phone rep nor I could figure out, for example, exactly what the four dots on the magnifying-glass handle do—and there's no manual to explain.

3D Atlas

3D Atlas shows a real globe. Drag the cursor in any direction, and the globe spins. Keep zooming in, and the ground appears to rush toward you. Click anywhere to identify the country beneath your cursor or type the first few letters of its name. Double-click to hear the country's name



3-D Delights When zoomed all the way out, 3D Atlas shows the whole globe.

pronounced, read information about it, and see a slide show of exquisite 16-bit color photos taken there.

Well-produced QuickTime movies tell of acid rain, global warming, and the like. There are computer-generated fly-by movies of mountain ranges; time-lapse exhibits that show the ozone hole; a statistics mode that shows various countries' population, income, and other data; and a trivia game that tests your knowledge of currencies, flags, sights, and capitals.

There are frustrations. You can spin the globe infinitely on two axes, but you can only make it spin from pole to pole. The display window is only 4½ inches square. And if the QuickTime narrator says "nuke-ular" *one more time* . . .

The Last Word

Every day, TV and newspapers show us glimpses of the earth: a map here, a photo there. Small Blue Planet offers superior satellite photos, but its interface and speed problems trip it up. 3D Atlas, on the other hand, is rich, well designed, and fast; and it gives you a new way of thinking about this big blue planet.

—DAVID POGUE

MacTools Pro 4.0

Disk Utility

PROS: RAMboot eliminates restarting from floppies; useful built-in help. **CONS:** Requires large amount of RAM; expensive technical support. **COMPANY:** Symantec Corporation (503/690-8090). **LIST PRICE:** \$149.95.



MACTOOLS PRO'S LATEST upgrade now runs on Power Macs and offers users better help features.

The current version, however, drops System 6 support and will not run on the Mac Plus, SE, Classic, or PowerBook 100.

The redesigned MacTools Clinic program combines DiskFix, Anti-Virus, Optimizer, Undelete, and FileFix. AutoCheck, which scans your disk for directory problems, runs in the background and can collect disk-scan results from any Mac running AutoCheck on the network. Some MacTools Pro programs are unchanged. For example, FastCopy copies floppy disks and creates disk image files; DiskLight's flashing screen icons alert you to disk and peripherals activity; and the Backup program, despite its confusing interface, works with removable media and digital audiotapes.

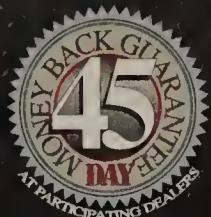
MacTools Pro's most exciting new feature is RAMboot. RAMboot automatically creates a RAM disk with a System file and the MacTools Clinic application, and automatically restarts your Mac from the RAM disk. When MacTools Clinic completes the repair or optimization, RAMboot automatically restarts the Mac from the usual start-up disk. For models that don't support a RAM disk—the Mac II, IIx, IIcx, IIfx, IICi, IICx, IIsi, Classic II, SE/30, LC, and LC II—MacTools Clinic lets you create bootable Emergency and Optimizer floppy disks.

The new QuickAssist is a help system that leads you through the disk-repair process. First, you check off the problems you're having from a list, and DiskFix runs the appropriate repair routines. SmartTips is a series of help screens detailing how to fix common problems.

DiskFix can now repair more disk problems without rebooting from a separate disk, and it can fix disk-directory problems that the previous version could not. DiskFix is faster than in the previous version, especially on Power Macs. The Optimizer program is also faster. But even

continues

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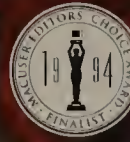
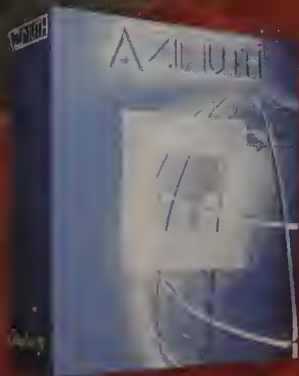
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MiniCad 5 offers all of the above and more. The award-winning software has been hailed as the "features champion" by Macworld Magazine. Graphsoft is dedicated to aggressive investment in CAD R&D. Graphsoft customers stay more productive than their competitors because Graphsoft supports both the latest technology and evolving user needs. MiniCad has long been the price/performance leader in Macintosh CAD. Don't be steered away from MiniCad by VARS who want you to buy high-priced CAD products that are hard to learn and only do a few things well. The VARS won't tell you that MiniCad 5 ships with a multi-media training CD, or that you receive 18 months of free technical support with Graphsoft products or upgrades. In short, MiniCad keeps more of your money in your pocket. Buy MiniCad 5 and save!

MiniCad 5 also includes: speed increases up to 100% even on 68K-based Macintoshes, a Claris CAD conversion program (including a \$495 competitive upgrade price, a Claris CAD translator and a helpful conversion guide), translators for importing and exporting to the other major CAD products, an upcoming Windows version, a powerful QuickTime key frame animation tool for creating and exporting stunning walkthrough and flyover presentations and a no-hassles 45-day money-back guarantee through participating dealers. Contact Graphsoft today for detailed literature. To order immediately, call MacWarehouse, MacConnection, or your local dealer.

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with MacTools' improvements, I found that Symantec's Norton Utilities for Macintosh 3.1 could mount and repair some crashed disks that DiskFix could not, reinforcing my belief that you should own both MacTools Pro and Norton Utilities.

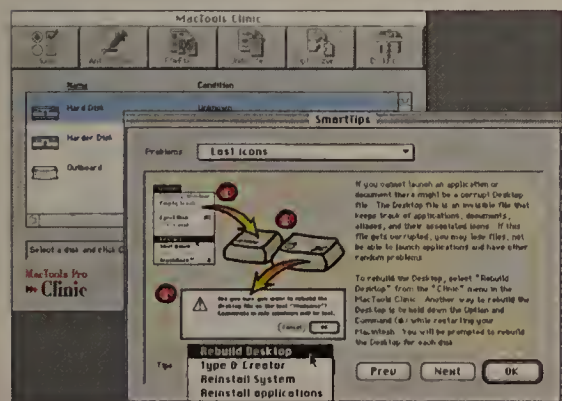
AutoCheck and Anti-Virus constantly scan the disk looking for problems. Both work well but require a ridiculous amount of RAM. AutoCheck needs 512K of RAM, and Anti-Virus and TrashBack together need approximately 270K. Norton Utilities' FileSaver requires only about 80K of RAM.

Technical support for MacTools Pro is expensive. Toll-free support calls are \$25 per call, and 900-number tech-support calls are \$2 a minute. Unlimited tech support is available for a flat rate of \$30 for 30 days. There is no free phone support for MacTools Pro. Many users buy a disk-utility program after they've had problems and usually need at least one support call. Symantec offers free tech support via E-mail to its BBS, and on CompuServe and America Online. Symantec's fax information line offers answers to the most-often-asked questions.

MacTools Pro worked well on my Macs, but after reports of an incompatibility between FastCopy and the AV Macs, Symantec released an updater program. The company is also working on an incompatibility problem between TrashBack, System 7.5, and QuickTime 2.0 that causes AutoCheck to report an incorrect amount of free disk space.

The Last Word

MacTools Pro does a good job of finding and fixing disk problems, and RAMboot and QuickAssist make disk repair easy. Unfortunately, MacTools Pro suffers from both expensive tech support and a large RAM requirement. If you might need technical support, you should consider buying Norton Utilities, which comes with 90 days of free, albeit not toll-free, support. If you've got the RAM, and tech support isn't important to you, I recommend MacTools Pro.—TOM NEGRINO



Helpful Hints MacTools Clinic's SmartTips lets you select a problem, then it gives you repair suggestions.

ClientTrac 2.0

Personal Information Manager

PROS: Easy to learn and use. **CONS:** Limited feature set; slow; large file sizes.

COMPANY: Whiskey Hill Software (415/851-8702). **COMPANY'S ESTIMATED**

PRICE: \$99.



CLIENTRAC IS A CONTACT MANAGER and scheduling program that provides new users with an easy entrée into contact management. But the program has enough limitations and outright flaws that you should look elsewhere for your PIM needs.

The action in ClientTrac happens mainly in the data entry screen (see "Homage to Rolodex"). You add contact data to the area that looks like a Rolodex card on the left of the screen, then as you work with the contact, you enter notes, phone logs, and other information on the right. The advantage of this layout is that even the most inexperienced user can be up and entering data into ClientTrac within a minute of starting the program.

ClientTrac includes the usual PIM features, such as a to-do list, phone dialing, a calendar, reminder alarms, and the ability to categorize clients and to sort or select clients based on category. There's also a basic word processor that allows you to write one-page letters for mail merge.

The program has a sales-automation feature that lets you create simple sales plans that you then assign to clients. You enter a list of steps in the sales process (phone calls, letters, and so on) that you want to accomplish with a prospect; then the program prompts you to make the calls and send the letters for all clients who have a plan action due that day. But ClientTrac's sales automation isn't flexible enough for real-world salespeople. There's no built-in conditional branching, so if you make a sale early in the process, you have to manually tell the program to skip all the remaining steps that are unnecessary. Another problem is that if you modify a sales plan after you have assigned it to a client, ClientTrac doesn't update the client's plan, significantly limiting your flexibility. It's not unusual to need to change your sales plans

in response to the changing conditions of your market.

ClientTrac is based on HyperCard; it is a complex stack integrated with the HyperCard player. As such, it carries with it the disadvantages of HyperCard. First, it's no speed demon, especially when searching or sorting cards. Sorting only 600 clients for mail merge took ClientTrac about 40 seconds on my Centris 650. Second, the program and data are enclosed in the same file, so to make a data backup you always have to back up the program; because the base program takes up 2.5MB, you can't easily back up your data to floppy disk. And the inefficient way HyperCard stores data means ClientTrac files can easily grow to more than 3MB. My 600-record data file (a 60K text file) took up 300K when added to the ClientTrac file.

Other annoyances with ClientTrac include limited, canned reports; a main



Homage to Rolodex Anyone who's ever seen a Rolodex will have no problems with data entry in ClientTrac. Just fill in the card on the left, and away you go.

data entry screen that you cannot resize; and windows that don't remember their size and position between launches of the program. There's also an odd Names list separated into alphabetical tabs; double-clicking on a tab expands all the names beginning with that letter. You can have only one of those tabs expanded at a time, though, so you can't view all of your clients in a single list.

The Last Word

ClientTrac 2.0 lacks the horsepower that users have a right to expect from a PIM. It compares poorly with competing programs that have close to the same street price, such as Now Software's Now Up-to-Date and Now Contact 3.0 (reviewed in *Macworld*, April 1995) or Adobe's DateBook & TouchBase Pro Bundle 4.0. Although the program works reasonably well, ClientTrac's sole advantage—extreme ease of use—isn't enough to recommend it.—TOM NEGRINO

Sales-O-Gram

All Sales Representatives
Kenton O'Keefe
Sales Manager
Subject: Persuasive power of color presentation

- Color increases ad readers
- Color ad increases sales 42%
- Color documents provide
- Color improves attention

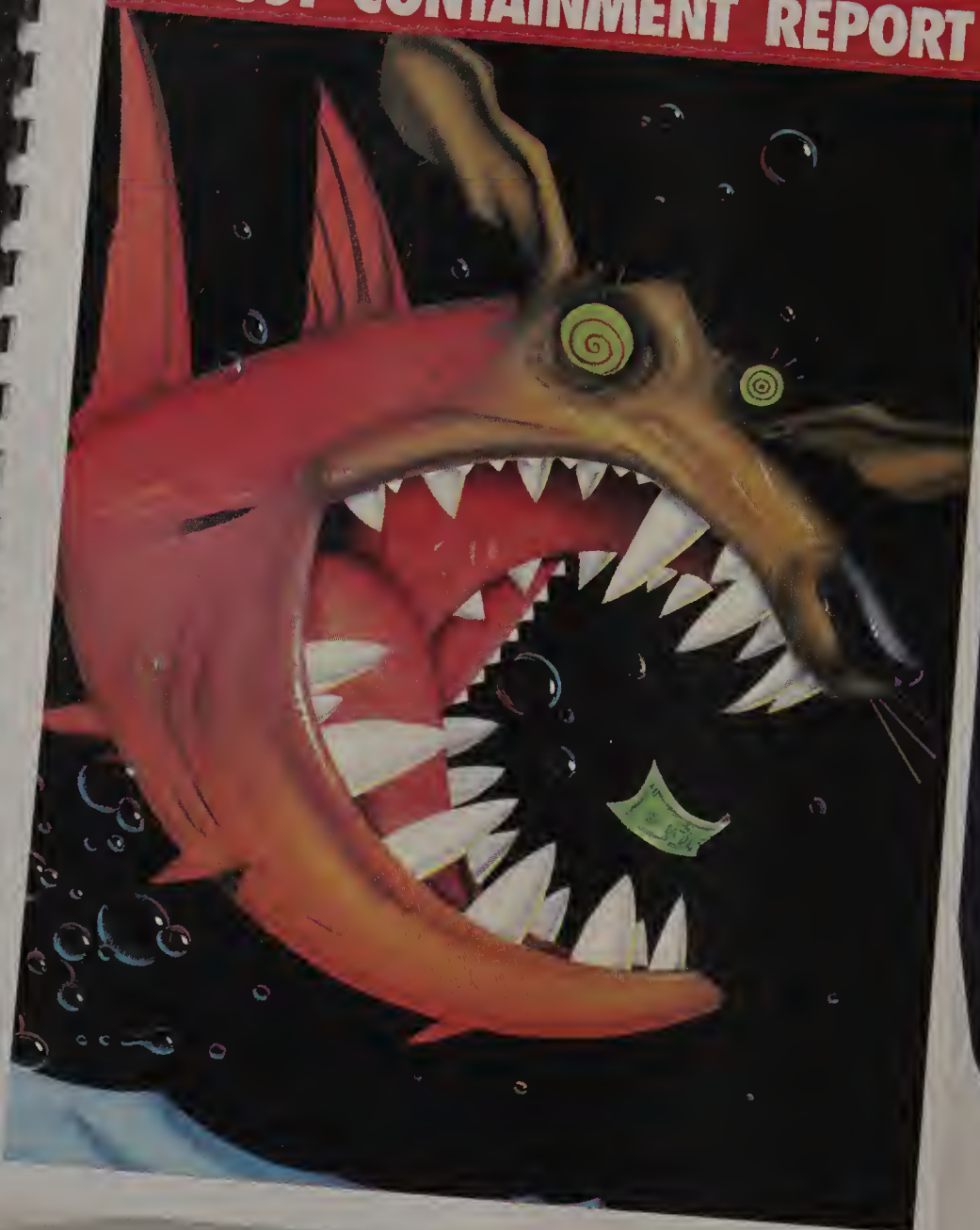


Improves
on per
back

Attention
Agreement
Comprehension
Attention
Perceptions

[1] CARR Report No. 110.3A "Does Colorship?", Cahners Publishing Co.
[2] "Update on split run tests on sales #20"; internal report of color versus black and white per Association of America.

COST CONTAINMENT REPORT



Business Color P COLOR PPM

er 340

or Laser

COST PER PAGE

Phaser 340

Color Laser

PRINTER PRICE

Phaser 340

Color Laser

Source: PC Magazine
November 22, 1994 Annual
Printer Review

Tektronix

Color is color, unless it's brilliantly practical.

It's the business printer you've been waiting for.

Professional color so reliable, inexpensive and easy to use, it's a practical office tool. Speed? It's the world's fastest color printer at 4 color pages per minute. Cost? Full text pages on plain paper at 3¢ each. Color for 11¢ on office papers. Simplicity? If you can load a stapler, you've mastered this machine. Reliability? Add

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The Phaser 340 Color Printer.

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Tektronix

For free output sample or nearest dealer, call 800-835-6100, Ext. 1039.

Graffiti 1.01

Newton Text-Entry Software

PROS: Makes extended text entry possible for the penmanship challenged. **CONS:** You must learn a new alphabet. **COMPANY:** Palm Computing (415/949-9560). **LIST PRICE:** \$79.



I HAVE ALWAYS BEEN ENVIOUS OF PEOPLE with good handwriting, especially since I started using a MessagePad. But now, it doesn't matter. My MessagePad doesn't have to understand my handwriting—I just have to understand Graffiti.

Graffiti works like a pen-based typewriter: it pares down each character to a minimalist symbol, usually executable in one stroke. You tap to set an insertion point where you want your text to appear (the same way you use the Newton on-screen keyboard) and then start scratching away in a writing box roughly an inch square. If you write a symbol that Graffiti recognizes, it puts the corresponding character wherever you've placed the text-insertion point. The alphanumeric symbols closely resemble the letters or numbers that they represent. Graffiti uses one symbol for both upper-

and lowercase letters; you have to write a special symbol, called a shift stroke, to move from one character set to another. To activate numbers, punctuation, and special characters, you must use different shift strokes.

Graffiti's character set is remarkably complete. If there's a complicated text string that you use frequently, you can even assign it to a ShortCut. The online help is clear and easily accessible.

The 1-inch-square writing box sounds cramped, but it isn't; the worst problem is that your writing ends up outside the box. You can have the window surrounding the writing box slightly larger than the box itself, or you can choose Scratchpad, a larger window with room for jotting down notes. When not in use, both windows shrink to a small, movable button. Even in tiny-window mode, Graffiti was unobtrusive, although I did have to shift the window around to get to all the fields in a Newton Contact record. The Graffiti application takes up only 80K of RAM, and it was compatible with every text-entry New-



MARK JOHANN

ton application I tried.

Practice is the key when using Graffiti. Expect several weeks of use before you're comfortable writing on the MessagePad instead of notepaper. Within a week of applied Graffitiology, I was up to 20 words per minute at 90 to 95 percent accuracy. There are caveats: I print in all block capital letters. Those blessed with beautiful, flowing, script hand-

writing may need more practice to retrain their hand (ah, sweet revenge). Also, I'm right-handed, so I can't vouch for how well Graffiti works for left-handers, though there is a Lefty Layout for the Scratchpad. Finally, if you're scribbling notes on a pad of paper, you can abbreviate and generally cut corners with penmanship, but if you try either when using Graffiti, you're as likely to get *Qixedd farf tateknia* as that juicy quote from your interviewee.

The Last Word Graffiti isn't the magic elixir that will cure your MessagePad of all its woes, but it makes serious text entry possible, and that alone is worth the price. —CAMERON CROTTY

TypeTamer 1.0.4

Font-Management Utility

PROS: Good set of tools for managing fonts and checking font information. **CONS:** Can't customize display sizes by font category. **COMPANY:** Impossible Software (714/470-4800). **LIST PRICE:** \$59.95.



WITH 183 FONTS IN MY FONT menu, it's a long trip to ZebraWood. Therefore, I was happy to install TypeTamer, which—among its many other capabilities—groups fonts into families, allowing you to choose styles and weights from a submenu. Not only does TypeTamer shorten the Font menu, it offers several tricks for working more efficiently with fonts. For example, the program's Speed-Fonts feature lets you type the first few letters of a font's name to zip to that font in the menu. And the TopFonts feature places the names of the fonts used in a document at the top of the Font menu, allowing you to quickly select a font.

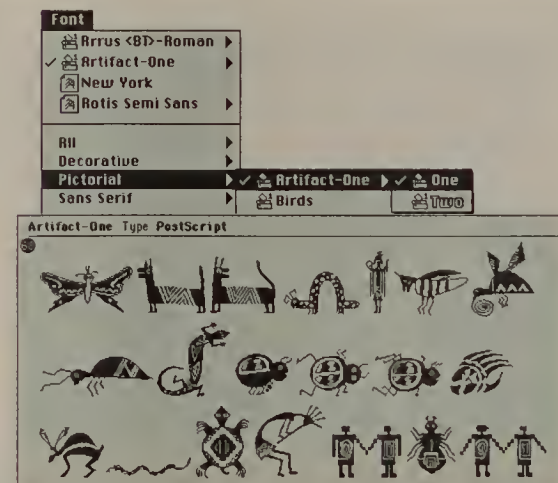
TypeTamer places an icon beside each font in the menu, showing whether it's a PostScript (including Multiple Master),

TrueType, or bitmap font. (This information is handy if you've forgotten to install the printer-font component of a PostScript font; the bitmap icon will appear next to the font's name, indicating that it won't print correctly.) Place the pointer on an icon to display a font's character set; upper- and lowercase letters are the default, but you can customize the sample text. TypeTamer shows sample text in three point sizes, which you can also change.

Can't remember which keystroke combination you press for the copyright symbol? TypeTamer can display a font's special characters, allowing you to simply point to a character to insert it in a document, rather than typing random shift-option combinations or opening Key Caps to find the proper combination.

Finally, TypeTamer lets you create your own font categories for the Font menu. If you're a designer, for example, you might want to place all your sans serif fonts together. Or you could place all pictorial or symbol fonts in one category, or perhaps divide fonts up by vendor. (A font can appear in more than one category.) Whatever categories you choose, you can add or delete fonts at any time.

I have few complaints about TypeTamer. I wish you could set different character-set-display sizes for each category, rather than one set of sizes for all; you might

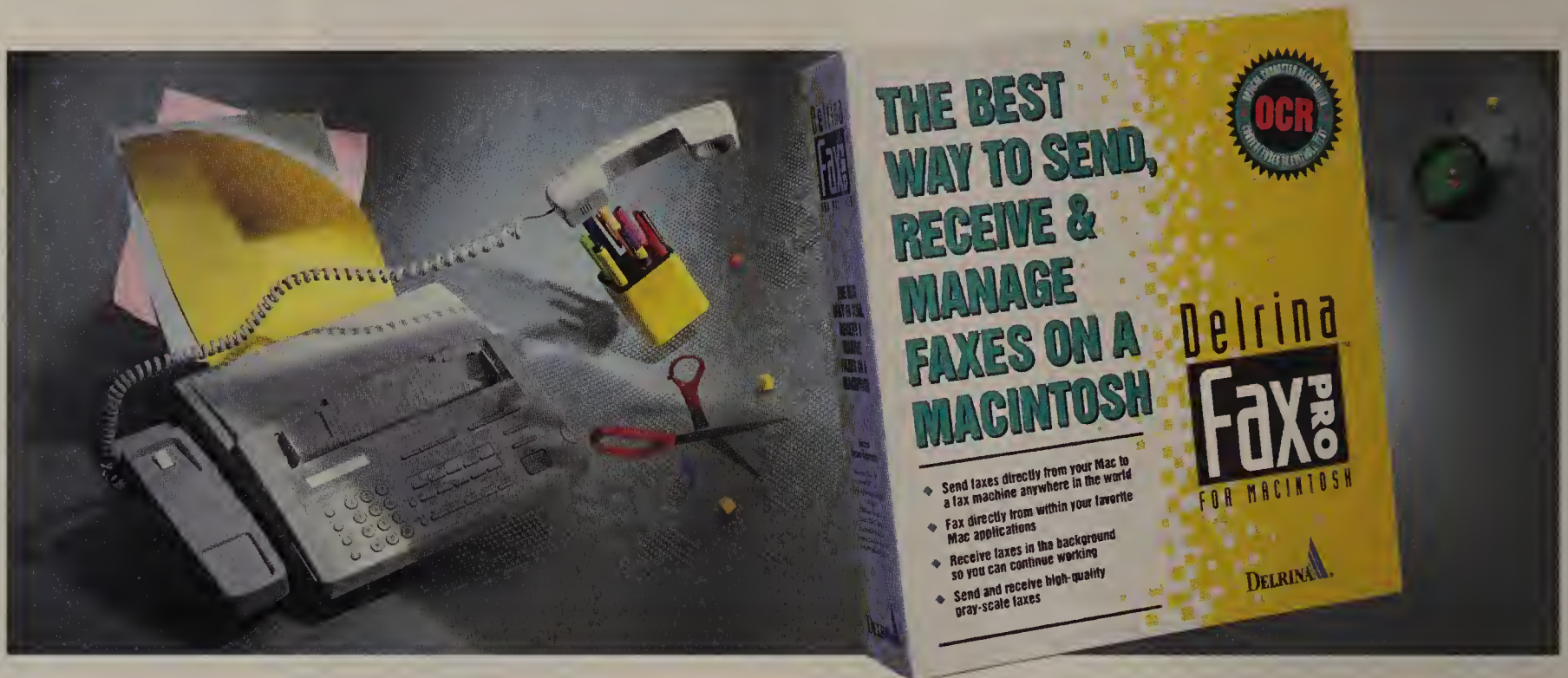


A Font of Information TypeTamer not only helps you manage your fonts by grouping them into custom categories in the menu, but also provides useful functions such as listing the fonts used in a document and displaying sample characters.

want to display pictorial fonts at a larger size than text fonts, for example. The TypeTamer control panel should have an on/off switch to make it easier to enable and disable (you can, however, temporarily disable TypeTamer by pressing the shift key before accessing an application's Font menu). On the other hand, you probably won't have much call to disable TypeTamer.

The Last Word TypeTamer is a useful application that offers a variety of ways to make life easier for those of us with large—and ever-growing—collections of fonts. —ERFERT FENTON

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Delrina Fax gives you detailed information about your faxes. Viewing, printing, resending and deleting faxes are a mouse-click away.

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DragStrip 1.0

Desktop Utility

PROS: Provides single-click access to files and folders; compatible with Control Strip modules. **CONS:** No way to label items; no keyboard shortcut to bring DragStrip to foreground. **COMPANY:** Natural Intelligence (617/876-4876). **LIST PRICE:** \$39.95.



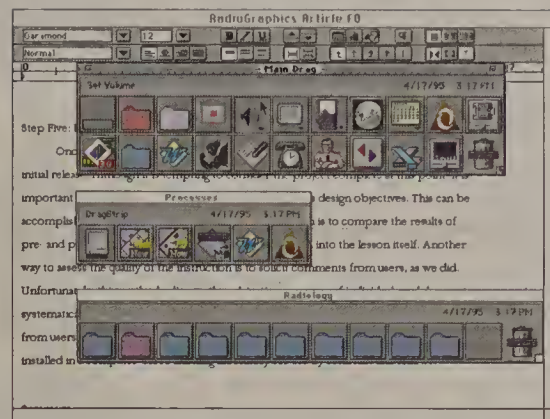
DO YOU WASTE TIME RUMMAGING through folders looking for files? Although you can get at frequently used items by placing them (or their aliases) directly on the desktop, a screen cluttered with icons isn't much of an improvement. DragStrip offers one solution. (For some reason, I wasn't able to get DragStrip to work on a Power Mac 6100, even though it is supposed to be PowerPC-compatible.)

DragStrip lets you create strips of blank tiles onto which you can drag items. Clicking on an item has the same effect as double-clicking on it in the Finder. If you click on a folder and hold down the mouse button, a hierarchical pop-up menu of the folder's contents appears; clicking and holding on an application's icon displays a list of

documents recently opened with DragStrip. You delete items by dragging them to the trash-can icon at the end of the strip.

Because DragStrip is an application, it may be less prone to conflicts than are system extensions or control panels. (DragStrip does require several Apple System 7 extensions to achieve full functionality, however.) This means that DragStrip must always be running in order to work. Moving the cursor to any corner of your screen brings DragStrip to the foreground; a keyboard shortcut for this would be a welcome addition. You can have more than one strip open at once, and you can drag or cut and paste items between strips. To make room for new items, you simply drag to make the strip larger. To conserve space on small monitors, you can hide a strip's title bar and status area from view, you can use small instead of standard-size icons, and you can display strips vertically.

In addition to working with files and folders, DragStrip lets you populate strips with modules similar to the ones that come with Apple's PowerBook Control Strip control panel. DragStrip ships with six of them, including one that lets you change your monitor's bit depth and another that displays a perpetual calendar when you click on it. (The DragStrip manual includes guidelines for writing new modules.) DragStrip also lets you display a strip that shows



Main Drag The status area below the strip's title bar shows the time and date, as well as the name of each item as the cursor passes over it.

all of your active applications. Clicking and holding on an application shows a list of its open documents for you to select from.

The Last Word The major drawback to DragStrip's approach is that the more crowded your strips become, the harder it gets to pick out a particular item. This is especially noticeable with folders, which look identical unless you go through the added trouble of assigning them custom icons. DragStrip compounds the difficulty by displaying only icons; future versions should let you display item names as well. With a few minor changes, DragStrip would be a worthwhile alternative to the Finder, especially for users with little Mac experience.—FRANKLIN N. TESSLER

QuePoint

Input Device

PROS: Does not require extra driver; can click on the pad itself. **CONS:** Small, awkwardly placed mouse buttons. **COMPANY:** MicroQue (801/263-1883). **LIST PRICE:** \$149.



SOME DAYS MY HAND ACHES FROM sliding around my desktop on a little hunk of plastic, and on those days I want to kill my mouse. I just want to grab it by its little ADB tail and feed it to my cat (who eats anything). The problem is that I haven't yet learned all the great Mac keyboard shortcuts, I am too uncoordinated to use a stylus and tablet, and I hate trackballs. Until recently, this meant that if I wanted an alternative to my mouse, I was out of luck.

Enter the QuePoint, a small input device that uses the GlidePoint technology that Apple licensed from Cirque Corporation for the Trackpad on the PowerBook 500 series (for an explanation of the GlidePoint technology, see "PowerBooks: The Next Generation," *Macworld*, July 1994).

Using the QuePoint is as simple as sliding your finger over the little gray pad,

which senses your movements via a grid of capacitance sensors below the smooth surface and translates them to your Mac. The QuePoint requires no extra driver, plugs into any ADB port, and has a pass-through for connecting other ADB devices.

The QuePoint senses motion in quite an intelligent way. Sliding your finger slowly across the pad moves the cursor a short distance across the screen; sliding quickly moves it further. With a little practice, I was able to move the cursor in word processing documents quite nimbly between words and letters with a short rolling motion of my fingertip. One of the QuePoint's nicer features is that it correctly interprets clicking on the surface of the pad itself, something Apple inexplicably left out of its Trackpad. Click-dragging requires a button-pad combination that I mastered easily. The QuePoint has two buttons located just below the pad. The left button is a regular mouse button, and the right is a click-lock button. Adjusting the tracking and double-click speed is as simple as opening the Mouse control panel that comes with your Mac.

Because your hand doesn't move around, the QuePoint requires very little desktop space and less movement of your arm. A 3-foot cord lets you place the pad wherever seems most comfortable. For PowerBook users with Trackpad envy and an ADB port, the QuePoint makes a nice



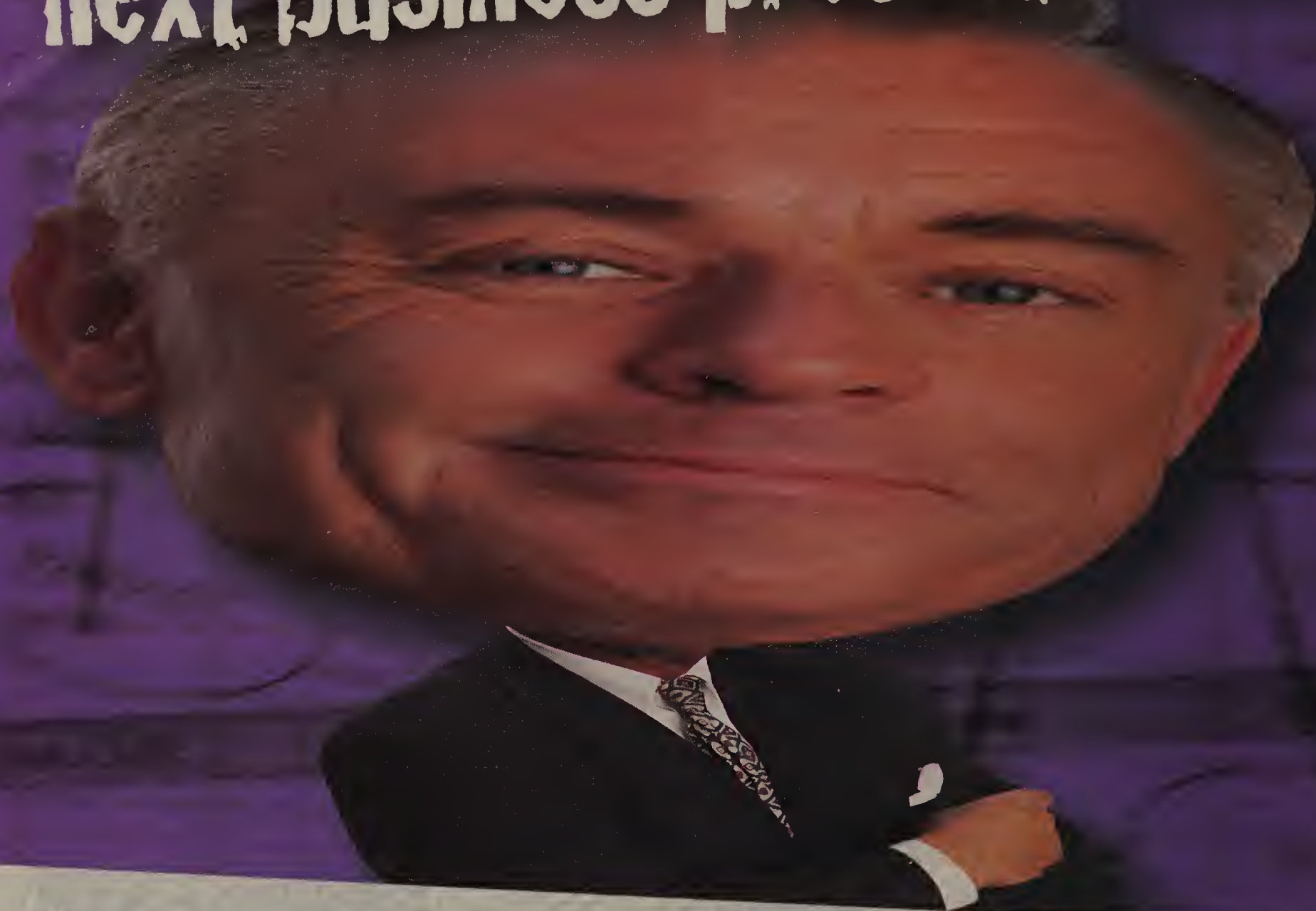
TOM GIBSON

alternative input device. At 2 inches by 3 inches (and 4 ounces) it easily fits next to your PowerBook on an airline tray.

Ironically, that compactness is also my biggest complaint. It isn't the size of the pad area that bothers me but rather the problems I have using the two buttons comfortably. The ability to double-click on the pad is great, but to use the click-lock feature of the right-hand button requires lifting my hand and an awkward reach with my thumb. I also wish there were a button above the pad, not just the ones below.

The Last Word The QuePoint is, literally, a point-and-click device. It will appeal to people who would rather finger-paint than use a brush. I'm not sure I'm ready to give up my mouse, despite my love/hate relationship with it, but the QuePoint is a welcome alternative.—MATTHEW HAWN

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NEC AudioTower

Multimedia Speaker System

PROS: Attractive design; extra inputs for external sound source and headphones. **CONS:** Mediocre sound quality; inconvenient controls.

COMPANY: NEC Technologies (800/632-4636). **COMPANY'S ESTIMATED**

PRICE: \$99.



AS THE OLD CLICHÉ GOES, YOU can't tell a book by its cover. If the NEC AudioTower Speaker System sounded as good as it looks, it would be a stellar product. Unfortunately, the sound of these speakers doesn't match up to that of comparable systems.

The speakers aren't towers compared with traditional stereo speakers, but at a bit over 11 inches high, they're much taller than other desktop speakers. They're no wider, however. On the top of the right speaker are controls for turning the system on, and for adjusting volume, bass, treble, and the balance between the speakers. While having all the controls here looks nice, it's less convenient than having the dials on the front, because you can't tell

which dial controls which function unless you get up from your seat and look at the top of the speaker. (All of the electronics are in the right-speaker module; the left module has just a speaker and jacks.) A hefty power cord looks more robust than other speakers' flimsy cords.

Unlike other manufacturers, NEC realizes that not all Macs have built-in CD-ROM players. NEC supplies an extra input for an external CD drive (or a regular CD player or cassette deck), and a headphone jack. Setup is simply a matter of plugging in a few cables and turning on the system.

Loudspeaker manufacturers generally use two or more speakers in each box for the best-quality sound. NEC pumps all of the sound into single 3½-inch speakers, a method that doesn't use the large cabinet space of these speakers to their best advantage. The built-in amplifier's power is rated at 5 watts per channel, with 10 percent distortion. That's about 20 times as much distortion as you get with your average stereo amplifier. According to the manufacturer, the speaker cabinets are tailored for superior bass response, but the advertised frequency response doesn't go below 150Hz.

I listened to an assortment of audio CDs, multimedia games, and QuickTime movies, and found the sound nothing to write home about. The basic tonal character was muffled, and voices had a nasal qual-



ROBERT PERRY

ity. The stereo soundstage on well-recorded CDs seemed foreshortened, confined to a narrow area just a few inches wide. High-frequency content was missing, and the speakers lacked sufficient bass response, even when I turned the bass-tone control to its maximum setting. When played loudly, the right speaker tended to buzz slightly.

The Last Word If the NEC AudioTower were judged by appearance and features (such as the extra input jacks), it would be a first-class product. But loudspeakers must sound good, too, and NEC's speaker system suffers seriously when you compare its sound with that of other products in its price range.—GENE STEINBERG

Living Album 2.5

Multimedia Album

PROS: Good compression; free stand-alone viewer. **CONS:** Interface is poorly designed and counterintuitive. **COMPANY:** QuickMedia Labs (408/749-9200). **LIST PRICE:** \$129.95.



LIVING ALBUM IS MEANT TO BE A moderately priced application for collecting multimedia elements. With more and more personal computer users making the move to digital images and sounds, it seems like a great idea. Imagine a wedding album crossed with a multimedia HyperCard stack: 24-bit color photos of the wedding party, the sound of the band singing "Louie, Louie," and QuickTime movies of the bride doing the lambada. But Living Album just doesn't live up to its promise.

To use Living Album, you need to collect digitized photos and/or digital video on your Mac. Once these elements are on your hard drive you can import them into Living Album individually or in batches using the application's import features.

Living Album lets you include up to 36 elements on a single page, and an album can

have 1000 pages. The elements appear as thumbnails surrounding the main viewing window. You navigate by selecting a thumbnail, which then brings the image to the central window. Living Album also offers two slide-show-style options. To annotate your album, you can attach additional movies, sound files, and text files to elements. Photos are not resizable or editable within Living Album, though you can copy them into other applications and work on them there.

The albums you create can then be viewed using the application itself or by using a freely distributable stand-alone viewer (527K as an installer file). For each page of an album, Living Album creates a special QuickTime source file that includes

all the elements on that page. This keeps file sizes small without affecting image quality. The file for the single-page album I created (26 photos in 24-bit color, 4 small QuickTime attachments, and no sound attachments) totaled about 700K, so the viewer and a small album will fit on a floppy disk.

But Living Album isn't as simple or intuitive as it needs to be. From the main viewing window, it is difficult to tell which entries have video, text, or sound attachments. The interface requires you to interact with too many unclear buttons and non-standard menu items, even in the slide-show modes. When I sent an album and viewer to a friend, she spent more time with the online help than with the album itself.

This crowded interface is more than a usability problem; it's an aesthetic one. The main window is just too busy, and the thumbnails surrounding the viewing area only add to the confusion, especially if you're trying to locate attachments. The interface is distracting, and it limits your ability to control the way you present your digital memorabilia.

The Last Word All of this is a shame because I wanted to like Living Album. There is a real need for a simple and inexpensive application for collecting digital images and sounds. But Living Album is too unpolished and awkward for me to recommend.—MATTHEW HAWN



Pretend It's Moving Movies appear in a movable window, not in the album's viewing area.

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 FileMaker Pro 4 Videos
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 FreeHand 4 Videos
 HyperCard 3 Videos
 Illustrator 4 Videos
 Infini-D 2 Videos
 Integrate Programs. 1 Video
 Lotus 1-2-3 3 Videos
 Macintosh 7.X 4 Videos

MacDraw Pro 2 Videos
 Mac P & L 3 Videos
 MacProject Pro .. 4 Videos
 MacWrite Pro 3 Videos
 MS Works 4 Videos
 Networking 1 Video
 Now Contact/
 Now Up-To-Date 1 Video
 PageMaker 6 Videos
 Peachtree Accntg.3 Videos
 Persuasion..... 2 Videos
 Photoshop 6 Videos
 PowerBooks 2 Videos
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Storybook Weaver Deluxe 1.0

Educational Software

PROS: Well designed; fun. **CONS:** Minimal drawing tools. **COMPANY:** MECC (612/569-1500). **LIST PRICE:** \$69.95.



STORYBOOK WEAVER DELUXE IS AN entertaining, creative educational tool for children ages 6 to 12. This CD-ROM-based picture-book-design program lets kids assemble elaborate illustrations, using backgrounds and clip art, and write stories to accompany the illustrations. It's a fun, flexible package that nourishes creativity.

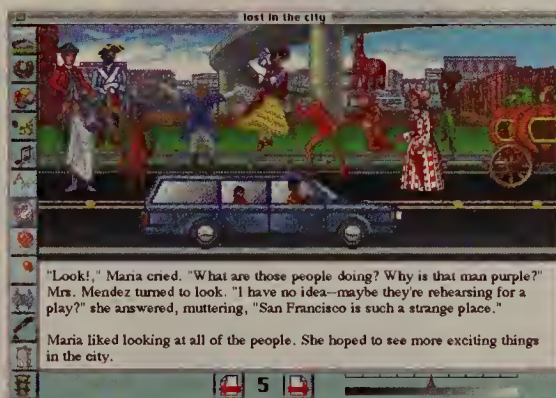
Kids create their stories using a tool bar. The tool bar's buttons provide access to the story ingredients, plus tools to edit the images. For example, clicking on the Scenery button brings up a window that contains all the backgrounds; you scroll through this window to select one. Backgrounds range from realistic outdoor scenes to castles and outer space. An object window contains images to place over the backgrounds, including adults, kids, real and fictional animals, vehicles, and objects.

While you can't edit scenery, you can

edit images. You can easily enlarge, shrink, flip, and layer objects from the tool bar. You can also change skin tones and the color of objects and clothing.

You edit images using the pencil and eraser tools in the image-editing area of Storybook Weaver. But the product lacks the more-flexible paint tools, such as the ability to adjust the pencil's weight and pattern, that many graphics packages offer. Computer-savvy kids may be used to those functions in other applications, so their omission here is a shame.

You can also associate sounds (such as a dog barking or a phone ringing) and music with a story. The sounds are represented by



Story Time I created this scene by selecting two backgrounds and then adding people and vehicles.

icons, though, and the choices are sometimes confusing. (A car for baroque music? It must have made sense to someone.)

After you create your story, select some text and the Speak option from the Goodies menu, and Storybook Weaver reads the text aloud. You can choose one of four different voices as your reading partner.

The program allows you to change menu items and dialog boxes to Spanish via a Preferences option. The Windows version reads highlighted text aloud in Spanish; according to MECC, the Macintosh version speaks Spanish properly only if Apple's PlainTalk is installed.

Finding help with Storybook Weaver is easy. It comes with a built-in help system and a clearly written, well-illustrated manual. The program includes a thesaurus and spelling checker, but it doesn't offer other story-writing helpers.

Storybook Weaver's main limitation is its delivery method: CD-ROMs are slow, and kids may find the program's speed frustrating (in my story, it took about five seconds to move from one page to the next).

The Last Word Storybook Weaver isn't much more than a word processor with clip art and sounds. But it encourages kids to develop their writing skills and creativity, and that makes it a worthwhile educational product. If I were a parent, I'd buy it for my offspring.—JOANNA PEARLSTEIN

Thinking Mouse Macintosh ADB

Input Device

PROS: Multiple programmable shortcuts; manual includes instructions on work-space ergonomics. **CONS:** Remembering button actions can be difficult. **COMPANY:** Kensington Microware (415/572-2700). **LIST PRICE:** \$139.95.



AT FIRST GLANCE, THE 70-PAGE user guide that comes with Kensington's new Thinking Mouse might seem like overkill for a pointing device—after all, many software applications ship with skimpier documentation. But the Thinking Mouse is more than just another mouse, and the hour or two it takes to master its many features is time well spent.

Like Apple's ADB mouse, the Thinking Mouse sports a smoothly rounded contour that fits both right- and left-handed users. (A rubberized coating on the sides prevents your fingertips from losing their grip, so you don't have to grasp the mouse too tightly.) Although the Thinking Mouse has a slightly higher profile than Apple's, I found it just as comfortable to hold for extended periods.

In place of a conventional button, the Thinking Mouse has four buttons arranged in two rows. (The two smaller buttons are slightly recessed to make them easy to distinguish by touch.) Out of the box, all four buttons work just like the button on a standard mouse, and I suppose that some people might be satisfied that way. But to really get your money's worth, you have to program the buttons to perform a variety of motion-reducing and timesaving tricks using an application that comes with the Thinking Mouse. For example, you can use the mouse buttons to perform commands like Save or Cut, or type up to 511 characters of text, all without reaching for the keyboard. (Optionally, you can assign up to four modifier keys that can be pressed along with a mouse button for an action to occur. While this increases the number of possible shortcuts, some people may have difficulty remembering what button-key combination does what.)

The Thinking Mouse shares a few other features with Kensington's Turbo Mouse trackball. For instance, you can customize acceleration response—the cursor's sensitivity to mouse movement—more precisely than with almost any other mouse. Another feature called Brilliant Cursor lets

you define locations on the screen called HotSpots. With Brilliant Cursor activated, the cursor jumps to the closest HotSpot when you move the mouse toward it. You create HotSpots by pressing a special key combination and clicking anywhere on the screen. Although getting used to Brilliant Cursor takes some time, this feature can make it easier to navigate large monitors. Another handy feature called Snap To Default automatically puts the cursor over the default button in any dialog box.

The Last Word One of the things I like best about the Thinking Mouse is the six pages on work-space ergonomics in the manual, a welcome addition that ought to become standard practice. (You can even set the software to remind you to take breaks at preset intervals.) If you're in the market for a mouse, I recommend the Thinking Mouse highly.—FRANKLIN N. TESSLER



ROBERT PERRY

No matter how fast can't outrun a power

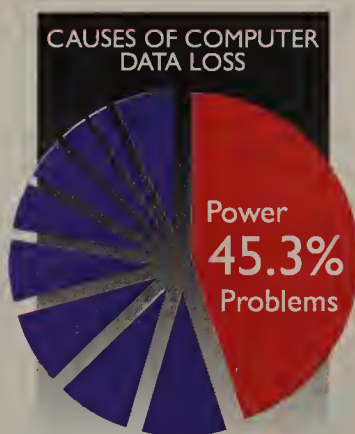
New Back-UPS: reliable power for your Mac

Just don't have the time for power problems on your Mac? Don't worry. They'll always make the time for you. It's not if a power problem will occur, but when. Due to household appliances, poor wiring, bad weather or even other office equipment, power problems are as inevitable as death and taxes. You can't run, but you can hide, behind APC protection.

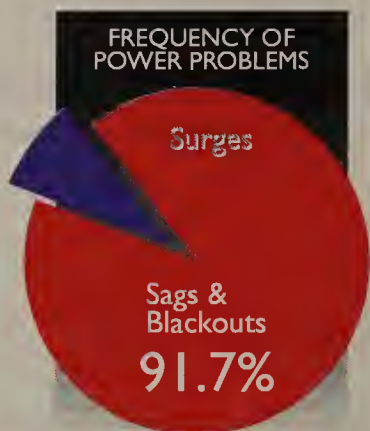
**IN THE NEXT THREE MONTHS,
MORE THAN 30,000,000 PCs WILL BE HIT
BY POWER PROBLEMS...**

Who needs power protection? If you use a computer, you do. A study in a recent *PCWeek* showed that the largest single cause of data loss is bad power, accounting for almost as much data loss as all other causes combined. Every Mac plugged into an outlet is vulnerable. In fact, you have better odds of winning the lottery than of escaping the sting of power problems. One study found a typical computer is hit 100 times a month, causing keyboard lockups, drive damage, or worse.

Simply put, if power problems are the least of your troubles, you've got one chance to keep it that way. You insure your car and home with the best policy you can afford. It just doesn't make sense to



Source: Contingency Planning



Source: Bell Laboratories

Power problems are the leading cause of computer data loss, while the most frequent type of power problems are undervoltages and blackouts, which surge suppressors alone are powerless to protect against.

leave your Mac (which is at far greater risk) vulnerable to loss or damage.

WHY A \$119 APC UPS COSTS LESS THAN A \$9.99 "SURGE PROTECTOR"...

Contrary to most people's belief, a Mac alone has more protection built into it than a low-end "surge suppressor," which is usually nothing more than a well-packaged extension cord. In other words, going without protection is as good as under-spending on one of the most important computer decisions you'll make.

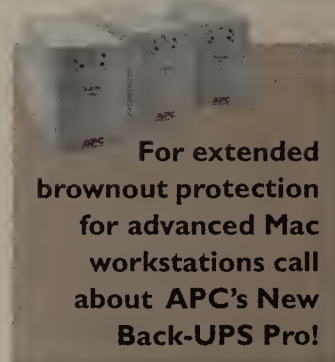
And since sags and blackouts represent more than 90% of power problems likely to hit your Mac, even quality, high-performance surge suppressors are literally powerless to protect your Mac from data loss.

That's why you need instantaneous battery backup power from an APC Uninterruptible Power Supply to prevent keyboard lockups, data loss, and crashes. With an APC UPS, you get six

times the protection of a high-end surge protector for little more than twice the price. And \$119 is much less expensive than false piece of mind.

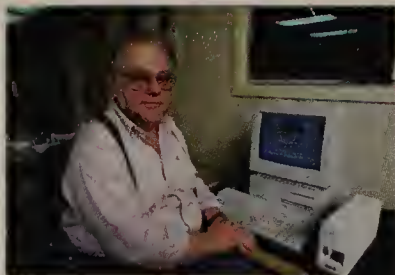
APC UPSs carry up to a \$25,000 lifetime guarantee against surge damage to your properly connected equipment,

and can suit any application, from servers and PCs, to fax and satellite systems.



**For extended
brownout protection
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workstations call
about APC's New
Back-UPS Pro!**

More than 3,000,000 satisfied customers count on APC reliability



Modern Press President Stephen Hopkins explains, "I protect my Mac Performa with a Back-UPS 400 and the unit works great. The Mac handles all bookkeeping, administrative and estimating functions for the company. It is a critical piece of my business. Unfortunately, we are located in an industrial park... a nice way of saying that our power fluctuates a great deal. After five years of reliable performance from my Back-UPS, power problems are no longer my concern. I can focus my energy on my business instead."

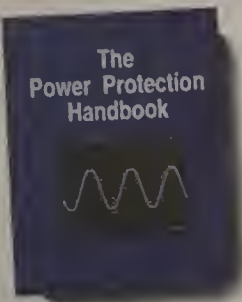


At Cellophane Square, Seattle's best known independent and alternative rock record store, Steve Marcus, Product Buyer, counts on APC to keep his Mac II SI and POS terminals running reliably. "The building where we started out was ancient and full of power problems. I lost lots of purchasing and product related information... until we invested in APC. I chose APC because they offer the most reliable product. I haven't been proven wrong yet. Problems continued in the building, but they were no longer a problem for us."



"We have over 30 APC units on our Macs," says Tim Girvin, principal of Tim Girvin Design, Seattle, WA. "Why do we protect every computer in the firm with an APC? As design consultants working on projects throughout the United States and Asia, 100% productivity is critical to project management. We cannot afford lost files due to power outages because of the complexity of many of the design programs we manage. Lost projects due to unprotected files is simply irresponsible. With APC in place, power problems are not even an issue, we are protected."





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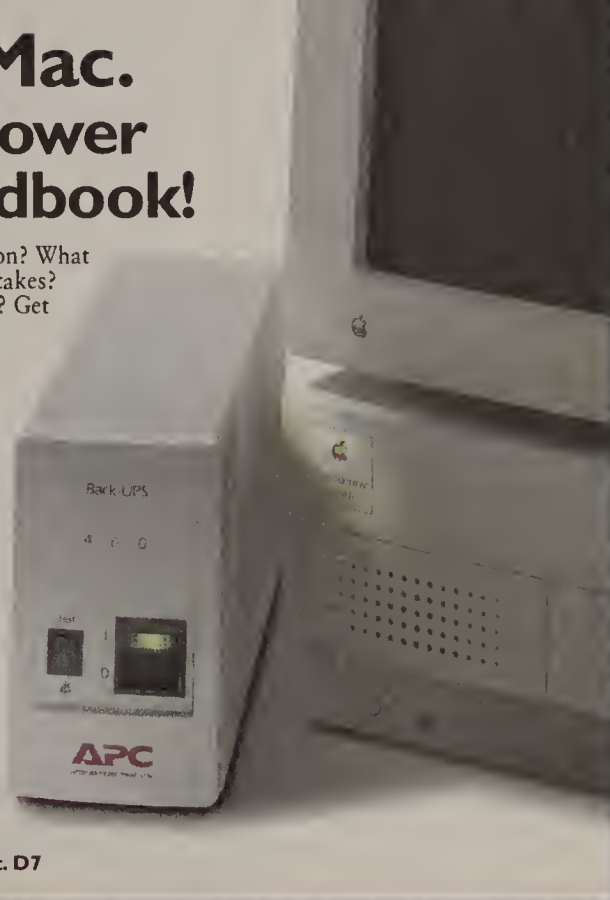
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MacWEEK "Ultimately, it's more a question of when - and not if - you should buy a UPS... UPS power protection has never been cheaper or more convenient"

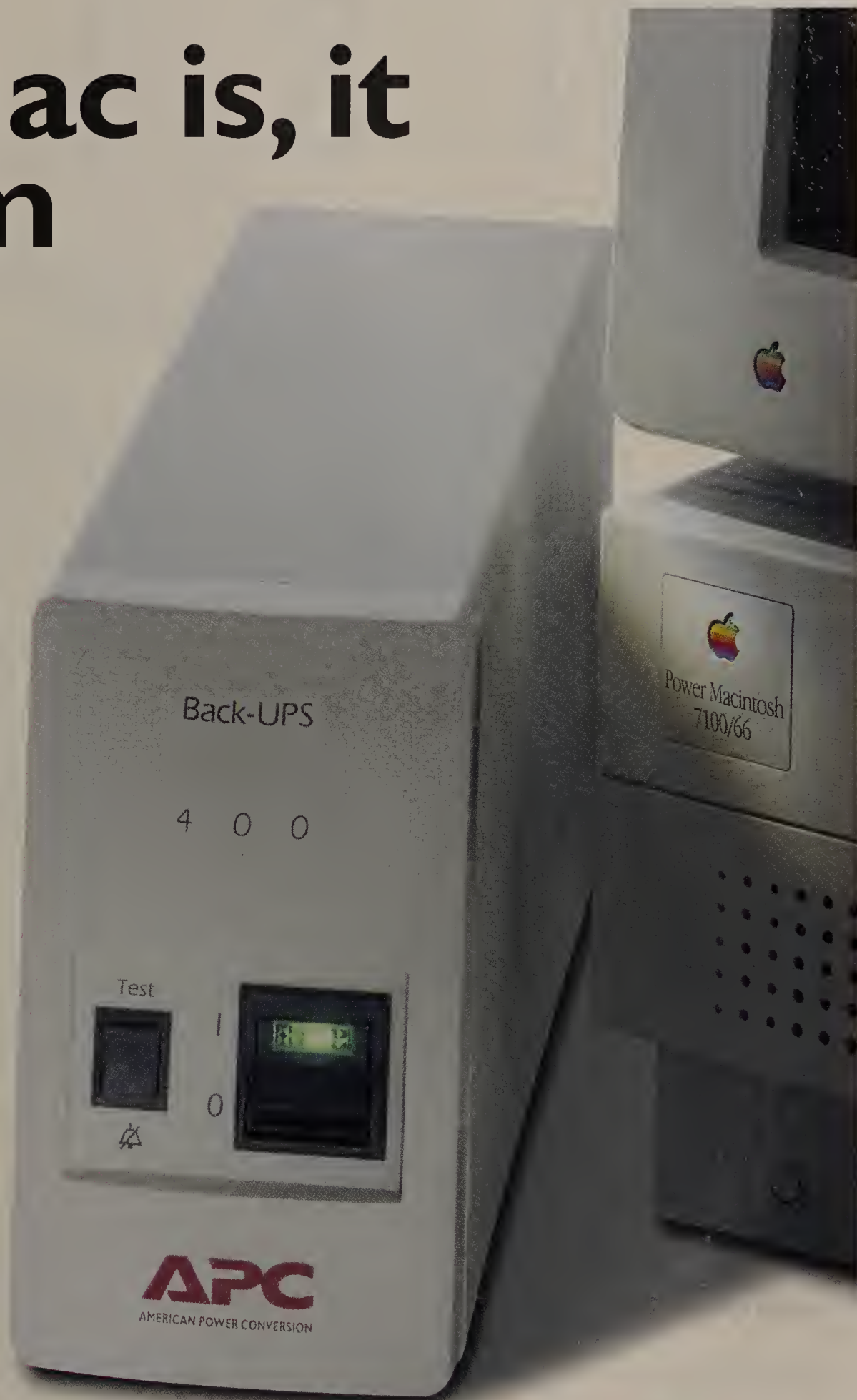
MacUser "If you have a server and don't have a UPS, you're playing with fire."



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I N S I D E

DISCOVER HOW APPLE'S THINKING

A P P L E ' S

TODAY WILL CHANGE THE SHAPE OF

D E S I G N

THE MAC TOMORROW BY LON POOLE

Practically everyone's head turns when a Ferrari drives by. What scores a hit for sports cars, watches, and stereos—sleek design—is now turning heads for computers. Performance, price, and reliability have

PHOTOGRAPHS BY NEAL BROWN dominated buying decisions for years. Now, look no further than the ads for hard drives, modems, and even network adapters to spot a changing attitude. As these devices become functionally alike, manufacturers are turning to sleek industrial designs to differentiate their products.

SMALL IS BEAUTIFUL

Miniaturized components from a PowerBook let Apple designers rethink the idea of a computer as a big box. Instead, small components—flat-panel displays, cordless keyboards, built-in CD-ROM drives, and push buttons for controlling playback of an audio CD—let designers think of computers as stylish furniture. The photo on the next page shows a different approach to computer-as-furniture.



More Than a Pretty Package Industrial design is not just a pretty package. The best design is one where the relationship between form and function achieves something greater than the sum of the components.

Apple was the first computer company to understand this. The compact, self-contained look of the original Macintosh emphasized and supported its easy, plug-and-play function and set it apart from other computers of its day. But this design advantage disappeared when the component-based Mac II began to dominate the line in 1987.

Years later, Apple returned to its original one-piece design philosophy with the PowerBooks. They became the hottest-selling notebook computers across all platforms, but the lead was tenuous. Other companies gained sales by copying the PowerBook. Then IBM took the lead with its ThinkPad, which was different from the PowerBook and stylish in its own right. PowerBooks have since faded a bit in popularity, even with the recently tweaked design.

PowerBooks notwithstanding, Apple always counted more on ease of use than on design to sell Macs. Now, with Windows 95 (and perhaps OS/2) breathing down System 7.5's neck, not to mention various licensees about to churn out clones running the genuine Macintosh Operating System, Apple can no longer get as much mileage out of its trendsetting user interface. The ease of use that once distinguished Macs is becoming a staple of all personal computers. That means Apple will need to rely more than ever on industrial design to differentiate Macs from other computers. When you break down established notions of what a tool does, you open worlds for new customers to explore.

Remember when the portable cassette player was once almost as big as a shoe box? Then Sony introduced the Walkman—old-hat technology, but way-cool size and style made it a must-have personal accessory. Apple luminaries have long predicted the accessorization of computer technology. The Apple Design Group is making it happen.

More Than One Way to Skin a Mac By regularly trying out ideas before they're needed in actual products, Apple designers stay poised for the challenge of "skinning" a typical new Apple product in 8 to 12 weeks. They explore design problems—say, reducing the size of a desktop system—by creating several alternative prototypes. Product developers order models of products that may or may not ever be manufactured. Even if the original concept goes nowhere, Apple often gains insights that lead to new products or that get applied to other projects. For instance, today's Apple Adjustable Keyboard and AudioVision monitor came out of designs for an advanced Mac that was never built.

The proprietary designs now under development for future Apple products are very closely guarded secrets. Despite the top secrecy, *Macworld* persuaded Apple to permit publication of the intriguing design prototypes you see on this and the following

pages. These prototypes will never make it to the factory floor for a variety of reasons. A couple of these designs are for concept computers: for exposition only, not mass production. Some are solutions for particular design problems. Others are mock-ups of product proposals that Apple has decided not to manufacture.

As you look over these pictures and stories, look for common themes and hints about future designs. For example, many of the prototypes have built-in CD-ROM drives, and many use infrared transceivers for cordless keyboard and mouse connections. Miniaturized components abound, even in desktop models. And just in case you thought complete voice recognition was around the corner, notice that keyboards are very much in evidence. Although these prototypes won't become real products, you can expect many elements to show up in real Apple products of the future. **m**



This sleek black model (also shown from a different angle on the cover) would make as strong a personal statement as any piece of art you might put on your desk. Its counterbalanced LCD display is reminiscent of the Tizio lamp designed by Richard Sapper and displayed in New York's Museum of Modern Art.



RADICAL NEW LOOK

The main unit of this dynamic prototype is curved just like today's desktop Macs, but there the resemblance ends. This main unit swivels on the four-footed pedestal so you can get at the floppy disk drive on one side and the CO-ROM drive on the other side. You can swing the main unit without dragging cables because the ports are in the pedestal. The flat display swivels and tilts independently. The display frame contains a microphone, speakers, and an infrared transceiver that connects cordlessly with the keyboard and its built-in trackpad. The emphasis of this radical approach is how you interact with the Mac, not on the Mac itself.



NEWTONS FOR ALL

For a personal device, the black Newton MessagePad sure lacks personality. But these Newton designs have plenty. The yellow Sports Newton borrows Sony's Sports Walkman idea—a ruggedized, high-visibility version for people on the go. If you carried a purple Game Freak, people would have no doubt that you're a serious video-game player. The red Newton On Site shows how the MessagePad could be given a custom look for a particular company or application.

MODULAR OVERKILL

Modularity seems like a winning solution to design problems. Trouble is, people become bewildered by too many configuration options. Case in point: you could configure this system as a pen-based tablet computer, a notebook with keyboard and touchpad, a full desktop computer, and more. The display module is a self-contained tablet computer controlled by a pen. At your main work site you could dock the tablet with a desk module and use the keyboard cordlessly. The desk module would provide more storage, enhanced networking and video, and expansion slots.



FROM A CEO ON THE GO

Sometimes Apple's designers respond to a hot-button issue from someone at the top. That was the case for this mocked-up videophone married to a PDA, based on sketches drawn by John Sculley, then Apple's CEO. While using the videophone, you could simultaneously link the PDAs to work interactively or exchange data. Designs like this purposefully ignore present-day constraints such as cost and component availability.



What you print should
match what you see and scan. Here's how

to make it happen. The Color You Expect

EVER PLAY THE CHILDREN'S GAME TELEPHONE?

YOU WHISPER SOMETHING IN ONE PERSON'S EAR,

WHO REPEATS IT TO THE NEXT PERSON, AND

SO ON. THANKS TO THE WAY PEOPLE TALK AND

LISTEN, AND THE ASSUMPTIONS THEY MAKE, YOUR

message, "The weather is fair in Monte Carlo this year," eventually turns into "They went to the fair and found Carl'd lost his ear." The last person in the chain receives a message, but it's not the message you sent. Getting correct and consistent output in electronic publishing can seem mighty similar, except that the subject at hand is color.

It all starts with an eyewitness account of the colors in a photograph or other image as reported by an input device. The input device—a scanner or a digital camera—reads each color to the best of its ability, using a system of red-, green-, and blue-coated charge-coupled device chips that mimic the red, green, and blue cones in the human retina. The result is an image described in terms of RGB color space.

The scanner sends its digital rendition of the original to your image-editing software so you can view it on the monitor. Aging phosphors may have lessened the monitor's reliability, and besides, you have the contrast turned all the way up. And who knows what the ambient lighting conditions are? But based on what your eyes see, you work away, blithely distorting the color story even further.

Then you export the image to your page-layout program, which conveys the color information to an output device, most likely a printer. The printer has a far more limited vocabulary—just the cyan, magenta, yellow, and black inks with which it re-creates your colors. The printer's version of your original story, therefore, must be translated from the RGB to the CMYK color space.

If your final output doesn't match your original image or the modified scan as it appears on screen, don't be surprised. Each type of device, even each manufacturer's implementation of the same type of device, interprets colors differently. And color-output devices print to different media—coated paper, color slide film, even final separated plates—using fundamentally different technologies such as thermal wax, dye sublimation, and exposed film.

Variations on the Color-Matching Theme

A color-management system (CMS) is a kind of diplomat, faithfully representing color as described by each device involved in the process—from the input color space through the monitor color space to the output color space. It is the job of a CMS to understand the foibles of each device in your arsenal, convert color spaces where required, and take into account different calibration solutions. Currently, six CMS products are out there vying for your attention: Apple's ColorSync, Monaco Systems' MonacoColor, Eastman Kodak's Precision Input Color Characteri-

by Deke McClelland



zation, DayStar ColorMatch, Agfa's FotoTune, and Electronics For Imaging's EFIColor Works.

A complete CMS is not the only color-matching solution, however. If you're really concerned about matching the image you create on screen regardless of what the original scan looked like, a simpler scheme may serve you better. Colorific from Sonnetech and Color-Composer from Radius both approach color matching as a matter solely between your monitor and your printer, ignoring the input color space entirely (see "Simple Color Matching").

Another exciting development on the color horizon is Light Source's Colortron, a hand-held device that reads colors from any surface, allowing you to match a single color with its counterpart on screen and on press with supreme accuracy. Not intended to manage thousands or millions of colors at a time, Colortron is the first desktop device capable of monitoring key colors and spot colors across the board (see "Low-Cost, Precise Color Measurement Comes to the Mac").

50 Ways to Name Your Color

Color-management systems all work toward matching colors as seen in a model lighting environment. The idea is that regardless of where you are in the electronic publishing process—scanning an image, editing a document on screen, or printing a composite proof—what you see on screen should match both the original photograph and the final output as viewed in this ideal setting.

To make this happen, a CMS has to calculate color transformations based on how human eyes perceive colors under these specific lighting conditions. The entire spectrum of light visible to the human eye is described according to CIE standards (named for the International Commission on Illumination). CIE is also known as device-independent color, because it is not dependent on the color-creation capabilities of some transitory piece of machinery. The only meaningful "device" is the human eye.

Several digital interpretations of CIE exist. Each has its own acronym—Kodak's YCC for Photo CD, for example, and Lab employed by Adobe Photoshop—but they all refer to the visible spectrum, not to the colors machines recreate using the RGB or CMYK space. To convert a color back and forth between a machine-specific color space and the larger world of CIE, a CMS has to consider three variables.

Gamut If you were to plot the visible spectrum on a 3-D graph, the boundaries of this globular shape would repre-

sent the CIE gamut. All colors outside this gamut—such as infrared and ultraviolet—are invisible to the human eye. Photographic film, RGB display, and CMYK printing each have different, though overlapping, gamuts, all of which fall well inside the CIE space. The CMS has to be aware of the size of each gamut in your system so that a document's colors remain accurate throughout the publishing process.

An aspect of gamut that is frequently overlooked is its density. For example, a 48-bit RGB and a 24-bit RGB image have the same size gamut, but the 48-bit image's gamut packs several million times as many colors into this space. Believable output depends on the CMS's ability to juggle color from a large to a small gamut. If too many colors pile up in one relatively small area of the gamut, you might get smooth transitions in blues and greens, say, but banding in reds and yellows.

Profile Every brand of scanning, displaying, and printing device excels at generating certain colors within its gamut and does a poor job with others. For example, a scanner that overemphasizes greens and underemphasizes reds will result in a color cast. A profile (or characterization) is a file that developers write to provide hints for getting the best color reproduction from their devices. Color-management systems use these profiles to negotiate the best color reproduction from one device to another.

Calibration A device profile represents its own kind of ideal. The standard profile for a monitor, for example, may well represent how the device performed the day it arrived in your office, but with time and use, color display capabilities tend to wander off course. Professional-quality devices such as imagesetters and drum scanners include calibration software to keep them performing up to snuff. You can even calibrate midrange monitors using a device, such as DayStar's Colorimeter 24, that adheres to your screen and evaluates the accuracy of certain RGB combinations. A system extension loads every time you start up your computer and changes your display as warranted by the calibration results.

A desktop scanner, however, is not a device you can calibrate by adjusting its internal optics. You have to correct images after they are scanned using a custom profile, which you are advised to update on a more or less monthly basis. MonacoColor, Kodak Precision, Agfa FotoTune, and EFIColor Works all allow you to create your own input profile by scanning a reference target and using software to evaluate the scan. Monaco, Kodak, and Agfa provide industry-standard IT8 targets;

EFI includes a modified version with fewer than half as many colors. When you finish, the scanner remains in the same shape it ever did; only its profile changes.

The Color-Management Process

Maintaining color fidelity among devices designed to work together is tough; but to test the current crop of CMS offerings, *Macworld* re-created the more typical production scenario, assembling input, display, and proofing devices from different vendors. The scanner was an Arcus II from Agfa. The SuperMatch PressView 21•T monitor and Thunder II GX•1600 video card came from Radius. And we used two printers—a Phaser 220i Color Printer thermal-wax device from Tektronix and a top-of-the-line Rainbow color proofer from 3M. With this setup, I discovered five potential steps in the color-management process:

1. *Characterize the scanner.* First scan an IT8 target (some CMS products provide them). Next, use the CMS's characterization utility to open the scanned IT8 target file. By comparing the scanned target with the settings for ideal targets, the characterization utility determines how to adjust the scanner so the colors of the scanned target would match the factory-set ideal target; the CMS then saves that information to disk as a profile for use with other scans.

2. *Calibrate and characterize the monitor.* Hardware calibrators, such as DayStar's Colorimeter 24 or the SuperMatch Display Calibrator Pro included with the PressView 21•T, can precisely measure the phosphors and the white point (the color temperature of the lightest value) of your display. The CMS uses that information to write a monitor profile to disk, and a system extension corrects the color output every time your computer starts up. If you don't own a calibrator, you can use one of the preset monitor profiles provided with the CMS package.

3. *Transform the scan to the monitor color space.* After scanning an image, you use the CMS to convert it from the scanner color space to the monitor color space. Of the current raft of CMS products, all except ColorSync rely on Adobe Photoshop for the conversion. ColorSync relies on your scanner's software to support the conversion.

4. *Print the image to a PostScript Level 2 device.* PostScript Level 2 allows vendors to build color-correction options into the PostScript printer description (PPD) file. Tektronix is one of the few vendors currently taking advantage of this option. When using the LaserWriter 8 printer driver (or a customized LaserWriter 7.1.2), you can correct to match

Low-Cost, Precise Color Measurement Comes to the Mac

When it comes to matching colors objectively, you can't trust your eyes, even under ideal lighting conditions. What you need is a spectrophotometer, an electronic device that gauges colors with absolute numerical precision.

By far the most exciting and least expensive spectrophotometer available for Macintosh users is the Colortron from Light Source (\$1195, 415/925-4200). Using a diffraction grating to measure color, rather than colored filters as do most scanners and some other spectrophotometers, the Colortron takes readings at 10-nanometer (nm) intervals across the entire spectrum of visible light (380nm to 700nm). Then, by either the ADB or serial port, the Colortron sends the spectral data to the Mac.

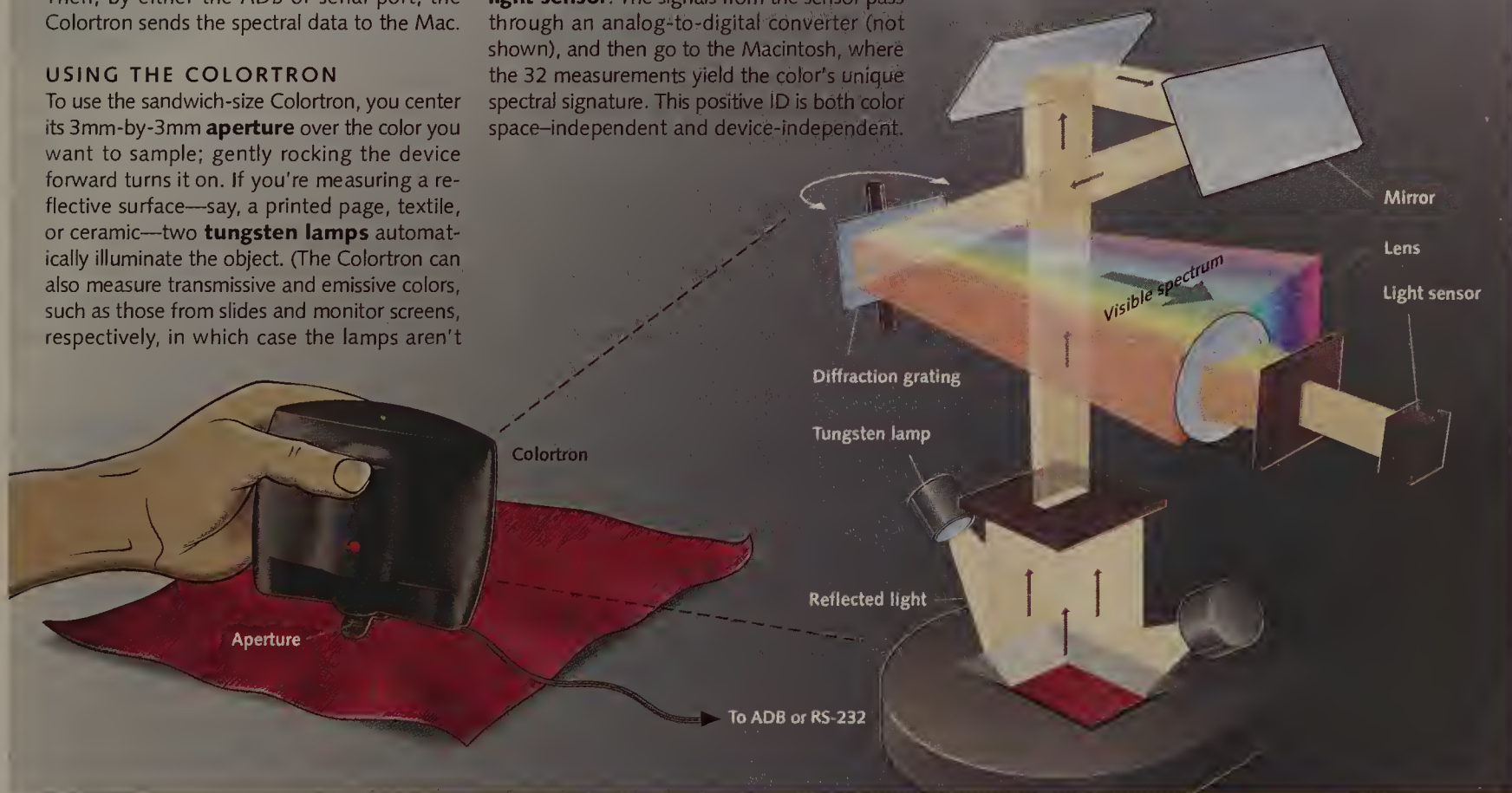
USING THE COLORTRON

To use the sandwich-size Colortron, you center its 3mm-by-3mm **aperture** over the color you want to sample; gently rocking the device forward turns it on. If you're measuring a reflective surface—say, a printed page, textile, or ceramic—two **tungsten lamps** automatically illuminate the object. (The Colortron can also measure transmissive and emissive colors, such as those from slides and monitor screens, respectively, in which case the lamps aren't

needed.) **Reflected light** passes into the Colortron and bounces off two **mirrors** onto the **diffraction grating**, which acts like a prism, separating the light into its component parts according to wavelength. A motor rotates the grating on a vertical axis in 32 distinct increments, one for each 10nm slice of visible light energy. The grating directs each of the 32 diffracted bands through a **lens** and onto a **light sensor**. The signals from the sensor pass through an analog-to-digital converter (not shown), and then go to the Macintosh, where the 32 measurements yield the color's unique spectral signature. This positive ID is both color space-independent and device-independent.

TWO ADVANTAGES

The Colortron avoids two problems found in some other spectrophotometers. Because it uses the diffraction grating to split the light, it is not subject to color drift that occurs when filters age. And because the diffraction grating rotates, the Colortron uses a single light sensor, eliminating the noise and recalibration problems associated with multiple-sensor devices.



the display, emulate the press, or boost the saturation of washed-out colors. This has no effect on the original image file.

5. *Separate the image for proofing or offset printing.* From inside Photoshop, you can convert an RGB image to the CMYK color space using separation tables. Only ColorSync lacks Photoshop color-separation tables. The separated CMYK image can be printed exactly as is from QuarkXPress or Adobe's PageMaker.

Optionally, you can skip step 3 and convert directly from the scanner to the printer space according to a printer profile. Then you trust a CMS XTension for QuarkXPress to convert the corrected image to the CMYK color space. DayStar and EFI both provide such XTensions, as does the software that accompanies the 3M Rainbow.

Managing the Rainbow

Every CMS on the market escorts digital colors from concept to output. But each works in its own peculiar way, offering its

own benefits and drawbacks. They all work given the right conditions, but I didn't discover a perfect system. What follows is the current state of the CMS product universe, explored in terms of how each one addresses the three pivotal issues—scanning, display, and output.

ColorSync 1.0.5 ColorSync is a CMS in progress from Apple (408/996-1010). Version 1.0.5 ships with System 7.5 and is a cornerstone of QuickDraw GX (though QuickDraw GX is not required to run ColorSync). ColorSync is the picture of simplicity: you simply choose a profile for the device that you want to match from a pop-up menu. ColorSync converts RGB colors to the CIE color space and generates new RGB values for display on screen and conveyance to a PostScript Level 2 printer.

But the Apple CMS relies heavily on third-party applications to support it, rather than actively supporting the applications, as its competitors do. First, System 7.5 ships with only a handful of Apple-brand monitor profiles, so you

have to look elsewhere for third-party hardware characterizations. Further, Apple provides no utilities for characterizing and calibrating hardware, requiring you to buy additional software and hardware (a hidden cost in this otherwise free CMS). Then too, a scanning application must seek out ColorSync in order to make the transformation to the monitor color space. So far, Light Source's Ofoto is one of the few applications to seek out and use ColorSync data. Then there's the matter of making the conversion to the printer. The LaserWriter 8 printer driver is ColorSync aware, enabling most midrange color PostScript Level 2 devices to take advantage of it, so long as they ship with ColorSync profiles. Pixel Resources' PixelPaint Pro 3.01 not only ships with ColorSync printer profiles developed by Pantone for use with its Open Color Environment (POCE), it also lets you preview an image as it will print from a specified ColorSync-profiled device. However, there are no profiles for printing presses, and most professionals prefer



JOHN REED FORSMAN

Color Correction: The Partial Solution In the first image (left), a typical Photo CD scan opened inside Photoshop with no color modifications at all, the pears are reddish brown, the lemon is orange, and the raspberries are purple—all out of sync with the original transparency. I transformed the colors to my monitor's color space using Kodak Precision to arrive at the middle image. The colors are truer, but the image remains overly dark and softly focused. Last, I corrected the lighting and focus manually inside Photoshop, arriving at the accurate representation on the right.

to see their CMYK artwork on screen rather than trusting the printer's PostScript interpreter to make the transformation invisibly.

MonacoColor 1.51 MonacoColor (\$495; Monaco Systems, 508/749-9944) is a more fully realized CMS than Color-Sync but requires a significant financial investment. It's the strongest CMS of the bunch in terms of automatically evaluating and correcting scanned images. The program ships with two 4-by-5-inch IT8 reference targets: one is a transparency; the other is reflective, for calibrating scanners. Monaco's extensive documentation takes great pains to explain how to properly scan either target using any of several brands of desktop scanner.

Rather than operating at the system level, as the other color-management systems do, the heart of MonacoColor comprises two Photoshop plug-ins. One lets you save the target to disk in a proprietary format; the other calibrates the scan. Calibration involves not only color correction but also color-cast compensation and unsharp masking. The result is a corrected scan that's ready to import into a layout program. And because you apply MonacoColor from inside Photoshop, you can easily undo the automatic corrections if they don't suit your needs.

Beyond scanner calibration, however, MonacoColor is a mixed bag. It assumes that your monitor is fully calibrated. This CMS includes no profiles for different monitor brands, so what you see

on screen may not be faithful to either the scanner or the printer. This means the program is correcting for final output only. For press matching, MonacoColor includes a small supply of Photoshop-compatible CMYK separation tables. You need to consult your commercial printer to select an appropriate separation table. You can purchase additional options such as a batch processing module, Fujichrome and Kodachrome targets, and so on; but the prices quickly soar—the batch processing module costs \$2000; additional targets raise the price to as high as \$4000. A less expensive version of the software, MonacoMatch, costs \$149. It does not offer the unsharp masking and other image-enhancement functions found in MonacoColor, but it's a reliable solution for users on a budget.

Precision Packs Kodak Color Management Systems (800/344-0006) offers three solutions and plans to comarket a fourth with DayStar Digital. For end users the two most useful solutions are Precision Input Color Characterization 3.0 (PICC, \$295), for calibrating scanners, and the Device Color Profile Starter Pack 2.0 (DCP, \$69), which is a collection of monitor and printer profiles. For a cradle-to-grave CMS, you need both PICC and DCP. When you scan an image from inside Photoshop, the Kodak CMS Acquire module (which ships with Photoshop) asks you to select both an input profile and an output profile before taking you to your normal scanning software. The output profile is for either a monitor or a printer. Precision allows you to correct for the monitor and then in a separate step convert to the CMYK output space, or correct directly for the printer and not worry about how the image looks on screen. If you plan to edit the image significantly in Photoshop, you should opt for the former. If the image is fine and you plan merely on importing it into your layout package, then transforming the colors according to the printer profile involves

fewer steps and less hassle.

The \$295 PICC includes an IT8 target in both 5-by-7-inch reflective and 35mm slide versions. The PICC utility generates a scanner profile based on the target and tells you how accurate it judges the profile to be. For example, the profiles for the Arcus II that I used consistently rated high marks for accuracy (only to be expected of a brand-new \$3500 scanner); if your profile ranks low, the documentation suggests ways of improving accuracy. The DCP has six monitor profiles and eight printer profiles. The monitor profiles are named by their phosphor and gamma settings rather than by monitor brands. Most of us wouldn't know an EBU 1.5 gamma monitor from a P22 2.1 gamma, and frankly, we shouldn't have to; we should be able to select a profile named after the monitor. So unless you have a hardware calibrator like the Colorimeter 24—with which PICC is fully compatible—you'll probably want to correct for your output device. The DCP includes four proofing and copier profiles—three bearing the Kodak brand—and four press profiles (two domestic, one European, and one Japanese). One bonus of PICC over its competitors is that it can also correct Photo CD images. Even if you don't include an IT8 profile along with your photos for inclusion on Photo CD—as Kodak recommends—the CMS Acquire module includes generic profiles that performed reliably in my tests.

Kodak's third solution is the PCS100 Kit. Priced at \$7500, this system is only for serious professionals, including design houses, service bureaus, and commercial printers. It includes a NuBus acceleration card for processing transforms from the Photo CD YCC space. (If you've ever tried opening a Pro Photo CD image using the Acquire module, you know how exasperatingly slow this process can be.) A native Power Mac version of the module just recently shipped. The PCS100 Kit also includes output profiles and a 16-bit

display calibrator. For the professional on a budget, Kodak plans to bundle its P ICC with DayStar's ColorMatch, Colorimeter 24, and PhotoMatic (a Photoshop automation package). The bundle is slated to ship in 1995 and list for \$995.

ColorMatch ColorMatch (company's estimated price \$219; DayStar Digital, 404/967-2077) is basically an expanded version of the Precision software. DayStar has licensed the Precision system extensions and included a larger supply of Precision-compatible profiles. Though it lacks the scanner-calibration capabilities P ICC provides, ColorMatch is a good choice for designers and independent artists because it allows you to calibrate your display and easily transfer corrected images from Photoshop to QuarkXPress. It includes a monitor-profiling utility called ColorSet that works both with the Colorimeter 24 and without it. If you don't have a Colorimeter, you can select one of the preexisting monitor profiles and edit its gamma (the position of the

medium gray value) and white point.

To use ColorMatch, you first scan an image into Photoshop without any adjustments, just as when using MonacoColor. You then apply the automated correction function, which transforms the image from the color space specified by the selected scanner profile to that specified by the monitor profile. After editing the image on screen as desired, you save it to the ColorMatch TIFF format. ColorMatch asks you to specify the output device for the image and converts it to CMYK according to the printer profile.

After correcting the image, you have the option of importing it into QuarkXPress, where another ColorMatch utility takes over the separation process. This way, ColorMatch can correct the entire document, not just the image. Because the image is already separated into CMYK, it will print accurately from PageMaker or some other ColorMatch-unaware program. In this case, the document itself remains uncorrected.

ColorMatch does not include any profiles for the Arcus II scanner and the PressView that I used—but by using P ICC to characterize the scanner and the SuperMatch Display Calibrator Pro to characterize the monitor, I was able to make ColorMatch work just fine. In fact, when combined with P ICC, ColorMatch is one of the most affordable and functional color-management systems around. It still needs more profiles—particularly for proofing devices—and it can be slow in searching for profiles on disk, but it does a good job of managing the gamut in a way that both works and makes sense to most designers.

FotoTune 1.1.3 Agfa Division of Miles (508/658-5600) offers FotoLook, a scanning program bundled with Agfa devices, and FotoTune, a \$395 desktop CMS package that is likely to meet the needs of most electronic publishers and artists. FotoTune integrates its own scanner-characterization capabilities. The program requires that you perform a lit-

SIMPLE COLOR MATCHING

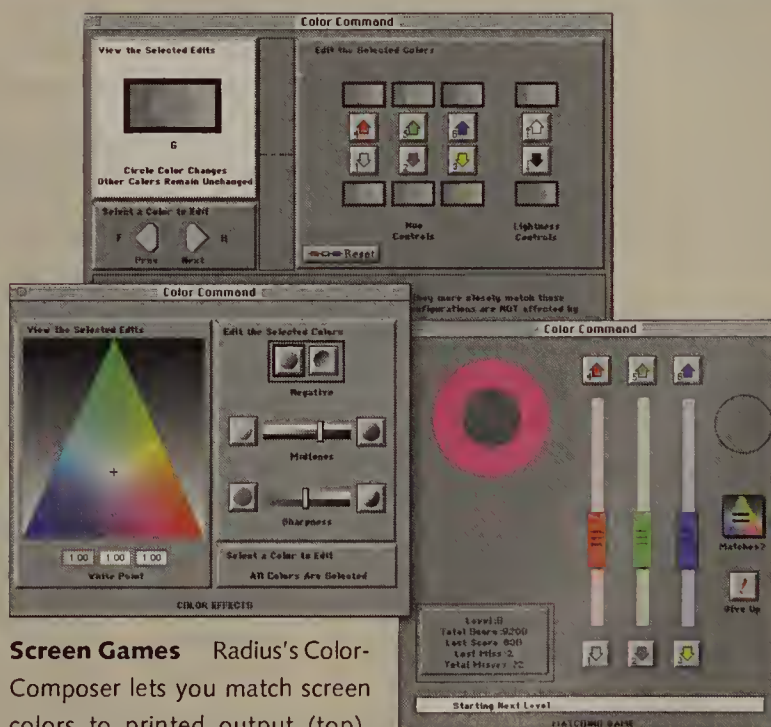
What if your color-matching needs are localized? You work alone; maybe you use scanned images but don't have your own scanner. What you care about most is matching what you see on screen to the printed output. Do you really need to install a full-blown color-management system and calibrate every piece of hardware in your office just to get predictable color? No.

Two new products, Colorific from Sonnetech and ColorComposer from Radius, handle localized color matching without the fuss. Colorific matches your printed output to your screen display by relying on ColorSync to translate the monitor profile to your printer. ColorComposer works without any CMS at all: a system extension calibrates your screen at start-up to match your printed output. In both cases, it's up to you and your image-editing software to apply whatever changes you want to your digital images; the software merely ensures that what you see on screen is

a reasonable facsimile of what you'll get from your printer.

Colorific comes bundled with many makes of medium-priced monitors, including those from NEC, Nanao, and Mitsubishi. Colorific automatically installs ColorSync on your computer along with a base profile for your brand of monitor. You then modify the profile to match your exact monitor by matching a series of on-screen colors to a card that you stick to your screen. After you save the modified profile to disk, the ColorSync CMS translates the profile to any PostScript Level 2 device. In my testing, I found the colors are a surprisingly good match. Solid colors matched well, but banding was pronounced in gradations; this banding is due to color redistribution, especially on low-end printers. Colorific isn't suitable for presswork, but it's just the thing for overhead transparencies, color copies, and other office work.

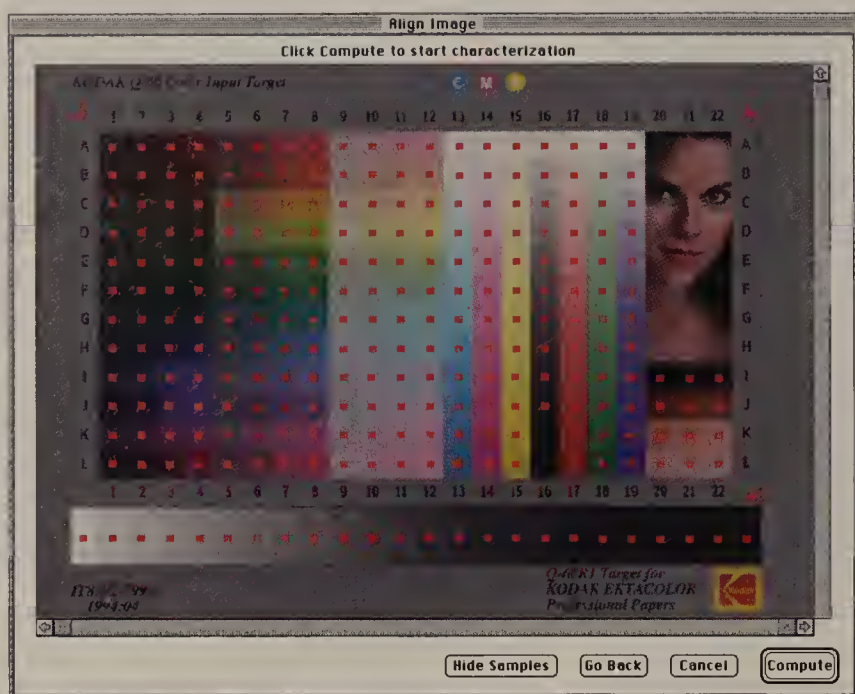
ColorComposer takes the opposite tack. Compatible exclusively with Radius and SuperMac video boards, the



Screen Games Radius's ColorComposer lets you match screen colors to printed output (top), adjust the white point and color cast by simply dragging a point inside an RGB triangle (left), and test your visual abilities and your understanding of RGB color theory by playing a color-matching game (right).

utility lets you manipulate your screen display until it matches your color output. Radius provides an image file containing a color photograph and a number of neutral targets. After printing this image on the printer you want to match, you adjust a series of on-screen targets to match the

output (see "Screen Games"). You can save printer settings for each printer you use. Unlike with Colorific, you can use ColorComposer to match imagesetter and film-recorder output accurately. Radius currently bundles ColorComposer gratis with all new Thunder video boards.



Characterizing Your Scanner Like MonacoColor and FotoTune, Kodak's Precision Input Color Characterization package ships with an industry-standard IT8 target. After scanning the target, the PICC software locates and evaluates the significant color areas, as indicated by the red dots. Then it compares these colors with its internal definitions and generates an appropriate profile.

tle more up-front work than do either MonacoColor or PICC—adjusting a few levels in Photoshop—but FotoTune offers the most targets, including a 5-by-7-inch reflective and both 4-by-5-inch and 35mm transparencies.

FotoTune provides several ways to transform colors. One way is to correct the scanner image for your monitor, edit the image in Photoshop, and then convert the modified RGB image to the CMYK output space. Or you can convert colors directly from scanner to printer, from scanner to device-independent CIE space, or from CIE to RGB or CMYK. FotoTune provides conversion modules for both Photoshop and QuarkXPress, along with 12 disks of device profiles (which Agfa calls ColorTags), more than any desktop CMS except EFIColor Works. Refreshingly, these profiles cover all types of proofing devices—including ink jet, thermal wax, Xerographic, and dye sublimation—so you can get color-corrected output even from relatively inexpensive machines. FotoTune also bundles profiles for three Agfa film recorders. However, there are no direct-to-printing-press profiles. Rather, you can correct for an offset-printing application—such as Agfa SetPrint—or for AgfaProof or dry-proof dyes.

FotoTune can skip the conversion to the CIE color space by establishing direct device-to-device conversions, called ColorLinks (also an option with the PCS100 package). (Agfa claims each transformation may potentially yield numerical

few liabilities. It's a little pricier than ColorMatch and PICC, and it doesn't let you edit monitor profiles. But it's a stalwart package, especially if you frequently work with Agfa input or output devices.

EFIColor Works 2.0 Electronics for Imaging (415/286-8600) seems to have the unique vision that a CMS should be self-contained, customizable, and inexpensive. In fact, although at \$199 EFI's EFIColor Works 1.0 sells for less than any of its competitors save ColorSync, EFIColor is probably the best solution for the largest group of users. It includes a hefty supply of profiles, it is well packaged and equally well documented, and it supports a wide variety of programs. In addition to working with Photoshop and QuarkXPress, EFIColor can be used to govern colors in EPS illustrations exported from Adobe Illustrator and Macromedia FreeHand. EFIColor Works also supports Cachet, EFI's image color editor and proofing application.

With that in mind, be aware that EFIColor Works needs to beef up in the area of scanner characterization. Though sufficient for correcting scans from low-end devices, the program's imprecise reference targets are unlikely to satisfy color professionals. On the plus side, you can use the Profile Editor utility to modify the settings for any device characterization. Scanner RGB curves; monitor white point and phosphor values; and printer dot gain, halftone settings, and transfer functions are all up for grabs. With experience and a few hardware-calibration tools, you can make any profile subscribe to your exact requirements.

EFIColor Works allows you to separate images inside Photoshop using separation tables, or simply to import RGB images into QuarkXPress to be converted and separated. An EPS XTension lets you correct object-oriented illustrations

errors that can result in image degradation.) You create a ColorLink by pairing two profiles—one for your scanner with one for your monitor, say. It takes FotoTune several minutes to create a ColorLink, but once it is finished, the ColorLink helps automate and accelerate future transformations.

All in all, FotoTune is a well-developed CMS with

as well. EFIColor Works claims to be the only CMS able to convert from one CMYK color space to another, a must for illustrations and high-end drum scans. EFI provides profiles for direct offset-press printing and for digital color copiers. It's not the perfect CMS we've all been waiting for, but it is functional, affordable, and generally easy to use.

The Last Word

Someday our computers will quietly resolve all the complexities of color management in the background, but first several obstacles must be overcome. Compatibility poses perhaps the largest hurdle. Right now, color management is a closed system, revolving largely around scanning into Photoshop and printing from either Photoshop or QuarkXPress. If you print from some other application that isn't a staple of the prepress market, a CMS is significantly less helpful. All the careful color matching you applied to a scanned image is likely to go straight down the tubes. Want to see things fall apart completely? Try crossing over to the Microsoft Windows environment. Graphics professionals working in the Windows 3.1 environment eagerly await serious color-management tools.

What the computer-graphics world awaits most eagerly is a system-level solution that applies equally to all Macintosh applications and translates to the Windows platform with no adverse effects. This is the promise of Apple's ColorSync 2.0, due out this spring. The new version subscribes to the universal profile format currently being developed by the International Color Consortium (ICC). Third-party developers will also be able to plug their own professional-quality CMS functions into ColorSync 2.0, eliminating the need for the current crop of incompatible CMS solutions. Big players in the color publishing world, including Kodak, Agfa, EFI, Radius, and Nikon all pledge to support ColorSync 2.0. Meanwhile, Windows 95 will integrate Kodak Precision, which will also reportedly support the ICC standard format. Sun Microsystems and Silicon Graphics have plans to integrate Precision into their workstation operating systems as well. Of course, whether any of this will actually occur is anyone's guess. Apple has been promising a system-level CMS for two years. And should any of the players—Apple, Microsoft, Kodak, or the ICC—drop the ball, cross-platform CMS will have to wait until 1996 or later. **m**

Contributing editor DEKE MCCLELLAND is the author of *Photoshop 3 for Macs for Dummies* (IDG Books Worldwide, 1995).

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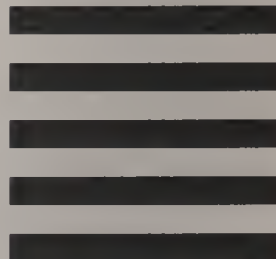
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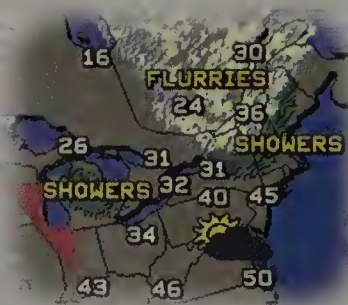




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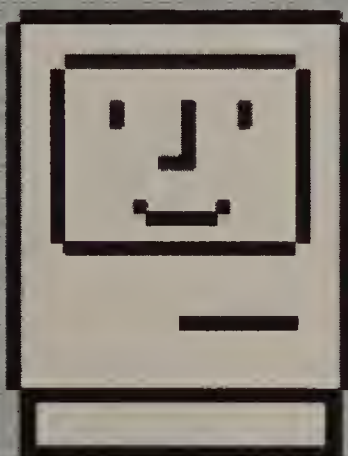
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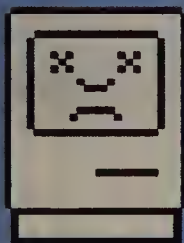
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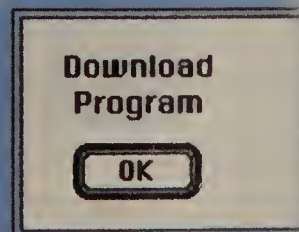
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The new 28.8-Kbps modem standard
is much faster—speedy enough
for the Internet. Macworld Lab
looks at the first V.34 products.

BLAZING MODEMS

NOW THAT YOU'VE FINALLY GONE AHEAD AND BOUGHT A 14.4-KBPS
MODEM, THE NEW, TWICE-AS-FAST V.34 STANDARD HAS ARRIVED, PROMIS-



ING 28.8-KBPS CONNECTION RATES
TO SPEED DOWNLOADS, ONLINE
NAVIGATION, AND REMOTE ACCESS.

Within weeks of the V.34 standard's being set in the fall of 1994, modem makers were already selling modems using that technology for fairly low prices (around \$250), and by the end of this year you can expect V.34 modems to be even cheaper, supplanting 14.4-Kbps modems as 14.4-Kbps modems supplanted 9.6-Kbps (9600-bps) modems a year earlier.

There's no question that V.34 modems will soon be commonplace (the table "Who Offers V.34 Modems?" lists the companies that expect to offer modems by the time you read this). But when should you adopt this technology? The first products range from top-notch to so-so, and it will take some time for

the market to settle into predictable reliability.

Macworld Lab tested the new V.34 modem technology on the first available products. As with most new technologies, there were a handful of problems mixed in with a lot of benefits. The benefit that you will find by adopting this technology depends on what you use a modem for.

Why Buy V.34?

As early adopters of 14.4-Kbps modems found, owning a fast modem doesn't mean you can take advantage of its speed. The rest of the world is still using slower technology, forcing you to slow down with it. Even today, many 14.4-Kbps-modem users must connect to online services or bulletin boards or remote-access servers at 9.6 Kbps. But about a year after 14.4-Kbps modems became popular and inexpensive, the modem infrastructure is starting to catch up to 14.4 Kbps; most online services and BBSs offer at least some 14.4-Kbps connections. And it looks as if 28.8 Kbps will catch on as fast or perhaps even faster.

Online Services This year, the most common use for a modem is hooking up to online services such as eWorld, Prodigy, and America Online. Online services don't own their own telephone lines and equipment; they depend on long-distance telecommunications companies with local phone access in thousands of locations. Converting these distributed locations to new technology is a major expense, not to mention a major logistical headache. Even though the major online services began converting to 14.4 Kbps last fall, most connections remain at 9.6 Kbps.



V.34 Engines Three modem chip sets—from Motorola, Rockwell, and AT&T—power most of the new 28.8-Kbps modems. The three modems here represent users of each chip set.

BY JEFF ANGUS

ing a 28.8-Kbps connection makes a real difference when using Internet services with graphical interfaces like Mosaic and Netscape: what at even 14.4 Kbps is too slow becomes acceptable at 28.8 Kbps.

BBSs It's not surprising to find BBSs as the most rapid upgraders to the new equipment: manufacturers such as Supra Corporation run aggressive, deep-discount promotions for BBS operators. File upload and download are the most common interactions on most boards, and that's where the V.34's speed becomes a significant advantage.

Corporate Networks The biggest beneficiaries of V.34 modems will be wide area networks (WANs) and point-to-point connections that have identical equipment at each end. Macworld Lab found that modems from the same manufacturer are more likely to talk to each other at maximum throughput than are modems from different manufacturers. This happens because modem standards leave room for individual innovation.

Remote Access New V.34 equipment is a big win for users of Apple Remote Access (ARA) and other remote-control-related software. Because these programs use a lot of resources to show the graphical interface, throughput is a big issue. But if you're buying a V.34 modem for ARA connections, be sure to have one at each end, and be sure the modem you're buying has a CCL (Communications Control Language) script for ARA. Many modems from PC-oriented companies don't include such a CCL, so you have to download the CCL from the vendor's BBS or do without. Having no CCL means you won't get maximum throughput, since the software won't

This slow conversion hasn't affected the majority of online subscribers. For the staples of traditional online interaction—sending E-mail and downloading small text files—speeds faster than 9.6 Kbps don't make much difference. But more people want to use the graphics-intensive interfaces the online services are putting up, and they want to download bulky multimedia clip files. For both, they need speedier throughput.

MCI Mail and CompuServe have been the most aggressive about upgrading to 14.4 Kbps, but America Online has redefined how online services need to think about throughput. America Online bought an Internet backbone builder, ANS, and is planning to use its fiber-optic

backbone to provide 28.8-Kbps connections in most major cities by mid-1995.

If you use America Online from a major city and make a habit of downloading big files, using 28.8-Kbps, V.34 modems will save you connect charges on file transfers. But most online-service users will get little benefit from the new modems and are better off waiting until they can count on the modem at the receiving end to be a V.34 modem, too.

Internet A few services provide V.34 connections for Internet access. One national provider with 28.8 Kbps is Northwest Nexus (206/455-3505), which says almost every major urban area will have at least one provider offering 28.8-Kbps access by the end of the year. Hav-

know about the peculiarities or capabilities of your modem.

Fax V.34 operates essentially at the same speed as the previous generation of Group III fax modems, so don't expect faster faxing.

Limiting Factors

You need to consider a few equipment issues before you buy a V.34 modem.

Serial Slowdowns The most frequent barrier to 28.8-Kbps throughput is the Macintosh's serial-port architecture. While this is no limit at all for people who own Power Macintoshes, people with 680X0-based systems will find the serial port the most frequent problem. When the serial port on those Macs was designed, 9.6 Kbps was the fastest rate used, so Apple designed for that speed.

A complication is LocalTalk, because Apple's serial structure supports both serial ports via the same hardware. If the modem and a LocalTalk network are simultaneously using the Mac's serial ports, the Mac must juggle the two, rationing resources. The more nodes on the network, the more traffic the port is passing and the less attention the port can pay to modem activity, which means your modem is not getting the data it needs fast enough to handle 28.8 Kbps (or even 14.4 Kbps in some circumstances).

There are solutions to both squeezes. The lowest-tech fix is to physically dis-

connect the LocalTalk connector from your 680X0 Mac and shut down AppleShare during modem sessions. Or you can buy an add-on NuBus serial card with better-designed ports and a 68008 processor aboard to handle the work. One such product is the \$299 Hustler II from Creative Solutions (301/984-0262).

CPU Bottlenecks The Mac's CPU can also be a bottleneck, since it has to process the information being sent to and received from the modem. Because the 680X0 Mac was designed with 9.6 Kbps as a maximum, older Macs' processors can be overwhelmed by the V.34 data rate.

Opinion is divided on the minimum Mac needed for a V.34 modem; some experts say you need a 68030-based Mac or better, and others say you can get away with a 68020-based system. Macworld Lab's testing indicated that a non-networked Mac II lost only about 4 percent of its throughput connected at a maximum BBS rate of 57.6 Kbps compared with the throughput using a Power Mac 7100 under the same conditions. That result indicates that a 68020-based system without a LocalTalk connection could handle the work of a 28.8-Kbps connection. A 68000-based Classic, on the other hand, started losing data—and requiring retransmission—at any rate above 19.2 Kbps; and it lost 28 to 50 percent of throughput speed compared with a 7100.

Setup Woes You might think that

installing a modem involves nothing more than plugging it into your serial port, but if your modem is new or it's not from an industry leader, you have to help your software build an initialization string, a set of characters that instructs the modem to behave a certain way. Most telecommunications and fax software offers a set of strings to select from, but if there is no string for your particular modem, you must either accept a generic configuration, which may deprive you of some features you paid for, or consult the documentation and enter the string yourself.

Unfortunately, modem documentation continues to suffer poor quality for most products, even though the quality has been getting better. There are some positive signs, however: Logicode has a well-designed and clear installation guide.

What to Look For

New modems usually go from state-of-the-art to commonplace in a few months, resulting in the new products' quickly becoming alike. But there's no guarantee that all the modems follow the same specifications. While standards like V.34 aim to assure that all modems are alike, most manufacturers try to outdo the standard with special tricks you can take advantage of—if you use just their product.

The Heart of the Modem A fundamental item in a modem is the chip set

Who Offers V.34 Modems?

Company	Phone	Toll-Free Phone	Product	List Price	Chip-Set Maker	Bundled Communications Software	Bundled Fax Software
Archtek America Corporation	818/912-9800	none	2834A-M	\$309	AT&T	QuickLink II Fax	QuickLink II Fax
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Bay Connection	408/270-8070	800/475-8329	Spectra-Com E 288mx	\$199	AT&T	MicroPhone LT	Faxstf
Best Data Products	818/773-9600	800/632-2378	2834F/FX	\$399	Rockwell	QuickLink II Fax	QuickLink II Fax
Circuit Research Corporation	603/880-4000	800/447-4448	FlexFax Maxim	\$875	Rockwell	Javelin	4-Sight
E-Tech Research	408/988-8108	800/328-5538	Bullet 100E	\$499	AT&T	QuickLink II Fax	QuickLink II Fax
Hayes Microcomputer Products	404/441-1617	none	SmartModem Optima, 28.800 V.34/V.F.C. Fax	\$579	Rockwell	SmartCom II	none
Logicode Technology	805/388-9000	800/735-6442	Quicktel 2814XVM	\$299	Rockwell	QuickLink II	Delrina Fax Lite
MacProducts USA	none	800/347-8739	Magic V.34	\$199	Rockwell	SITcomm	Delrina FaxPro
MaxTech Corporation	201/579-3630	800/936-7629	MaxTech XM288E (Mac)	\$219	Rockwell	MicroPhone LT	Delrina FaxPro
Motorola ISG	508/261-4000	800/487-1456	Lifestyle 28.8	\$345	Motorola	MacComCenter	MacComCenter
			Power 28.8	\$395	Motorola	MacComCenter	MacComCenter
			V.3400 Modem	\$895	Motorola	none	FaxTalk Plus
Multi-Tech Systems	612/785-3500	800/328-9717	MultiModem	\$749	AT&T	MacComCenter	MacComCenter
Practical Peripherals	805/497-4774	800/442-4774	MacClass 288MT II V.34	\$279	Rockwell	MacComCenter	MacComCenter
Prometheus	503/692-9600	800/477-3473	ProModem 28.8	\$249	Rockwell	Communicate Light	MaxFax
Supra Corporation	206/905-1410	800/727-8772	SupraFax Modem 288	\$250	Rockwell	MicroPhone LT	Faxcilitate 1.7.1
Telebit Corporation	508/441-2181	800/835-3248	FastBlazer 8840	\$1199	Telebit	none	none
US Robotics	708/676-7010	800/342-5877	Sportster Mac&Fax	\$359	US Robotics	MacComCenter	MacComCenter
Zoom Telephonics	617/423-1072	800/423-9477	V.34X Mac	\$329	Rockwell	MicroPhone LT	Faxstf
ZyXel Communications Corporation	714/693-0808	800/255-4101	Elite LED 2864	\$549	ZyXel	none	MaxFax with Voice

that controls the modem's hardware—it's essentially the modem's CPU. Just a handful of chip-set makers design, make, and sell chips to modem manufacturers. Which chip set a modem manufacturer chooses plays a key role in determining both performance and compatibility for the modem. Chip sets, particularly the first ones for a new standard like V.34, contain bugs. Modem manufacturers try to find and fix the bugs, which is why one company's modem using a particular chip set might work fine, while another company's modem has problems even though it uses the same chip set.

In the past, bugs in the chip sets were difficult to fix, but now many of the mid- and high-price modems have a flash ROM that allows software upgrades. Of course, the best modem is one based on a chip set that isn't buggy in the first place. Unfortunately, there's no way to know whether a chip set is buggy until you use it, and most modem vendors rush to get new-technology modems to market before their competitors, so the bug-discovery time is limited. Historically, the popular Rockwell chips are known for having bugs that must be fixed by modem manufacturers. And several modem manufacturers told *Macworld* they expected the same experience for V.34 chip sets.

It's also important to understand that there are vital components besides the chip set that modem makers buy from

other vendors, and there are items modem makers make themselves, with varying degrees of investment and levels of quality control. While the basic chip set is the single strongest indicator of stability, a vendor can fix the bugs of the worst provider and offer a high-quality modem, or combine cheap, low-quality components with a high-quality chip set and offer a mediocre modem.

To evaluate differences between models, Macworld Lab performed a range of tests to judge if the chip set made a difference. Macworld Lab's testing included connection and other performance testing of equipment with each of the three leading chip sets: AT&T, Motorola, and Rockwell. The benchmarks in "What Speed Do V.34 Modems Deliver?" show the results. We also found that two modems with identical chip sets could communicate 0.5 percent to 11 percent faster than could two modems based on different chip sets.

This effect was most marked with files that were already compressed with PKZip or Aladdin Systems' StuffIt and was insignificant in work with uncompressed files. This is true because the V.34 standard is explicit about how to handle uncompressed text files, so different models that meet the standard behave identically with uncompressed text. The standard does not direct how to optimize throughput of compressed data, however, so each vendor has implemented its own scheme; because each implementation is different, a modem works best when talking to an identical modem.

Macworld Lab was also unable to initiate a session between a V.34 modem powered by the Motorola chip set and another powered with the Hayes implementation of the Rockwell chip set, indicating, again, that a modem standard is something vendors tinker with.

What about V.Fast? Before the V.34 standard was finalized, some modem makers sold 28.8-Kbps modems using a de facto standard variously called V.FC and V.Fast. Essentially, V.Fast implemented the V.34 standard the way the modem companies *hoped* it would turn out. To a large degree, they knew what was going to be in the standard, and they were able to incorporate it. But they didn't predict the standard perfectly, so when a V.34 and a V.Fast modem communicate, the modems can't agree to communicate via a V.34 connection (since that standard wasn't implemented in the V.Fast). If the V.34 modem also supports V.Fast, they can communicate at 28.8 Kbps via a V.Fast connection. Otherwise, they'll settle on a 14.4-Kbps connection. Most V.Fast modems came with an



Next Modem Wave To beat V.34 performance, people must switch from standard phone connections to ISDN connections and use an ISDN modem, like this Motorola unit.

option to upgrade to V.34; if you own an upgradable V.Fast modem, be sure to get the upgrade.

Next-Generation Speed

Although very fast, V.34 technology hits the ceiling of what's possible (within the laws of physics) using the transmission of sound through telephone wires. So is 28.8 Kbps the end of the line? No—not if you change the type of telephone service you use. The technology that should break the 28.8-Kbps limit is ISDN (Integrated Services Digital Network), a leading-edge connection technology provided in some locales since the early 1980s. ISDN operates over the ubiquitous telephone lines that come into your house or workplace, but instead of doing the modem trick (turning digital data into analog sound waves at one end, and back to digital data at the other), ISDN simply transmits digital bits without the overhead of conversion at each end. ISDN carries 128 Kbps without compression, far more than a V.34 modem's 28.8 Kbps.

ISDN makes most sense for users who exchange large graphics files, distribute full-motion video, or need speedy remote access to LANs. America Online and some Internet providers, such as Menlo Park, California-based Internex (415/473-3060), now offer ISDN connections.

But unless you're very skilled with telephony, you'll require several hundred dollars' worth of help—from either your local phone company or a consultant—to choose and install the right equipment. Moreover, the chance of finding ISDN available in distant suburbs or rural areas is unlikely.

Most buyers will opt for the basic rate, or BRI, line. It has two 64-Kbps B (bearer) channels, each able to carry either voice or data, and one 16-Kbps D (delta) channel for overhead functions.

ISDN installation costs run from \$75 to \$750, averaging \$150. The service itself typically carries a \$50 monthly charge

Mac Cable Included	CCL Script Included (in box/through BBS)	Uses Flash ROM
yes	no/no	yes
no	no/yes	yes
yes	no/yes	yes
no	no/yes	no
yes	yes/yes	yes
no	no/yes	yes
yes	no/yes	no
yes	yes/yes	no
no	no/yes	no
yes	no/yes	no
yes	no/yes	yes
no	no/yes	no
yes	no/yes	yes
yes	no/yes	no
yes	no/yes	no
yes	yes/yes	yes
no	no/yes	yes
yes	no/yes	no
yes	yes/yes	no
yes	no/no	yes

What Speed Do V.34 Modems Deliver?

To communicate at its top speed of 28.8 Kbps, a V.34 modem needs to have a Mac that can process a high volume of data, a serial (modem) port that can handle high throughput, and a telephone connection that can deliver information at high speed with few or no line-noise errors. To gauge what users will actually experience with a V.34 modem, Macworld Lab tested several models using different chip sets with several Macs over real telephone connections and via a simulator.

We tested compressed and uncompressed files to gauge the efficiency of the modems' built-in compression features. Compression lets modems achieve a higher throughput than their standard data

rate: by compressing data to half its size and delivering it at 28.8 Kbps, a V.34 modem can in effect transfer data at 57.6 Kbps, for example. However, a modem will reduce its transmission rate if needed to ensure accurate data transfer over phone lines that can't handle the maximum rate or when communicating with a Mac or other modem that does not support the 28.8-Kbps rate. For Macs that don't support 28.8-Kbps rates, Creative Solutions offers the NuBus-based Hustler card, which is a popular option among BBS operators to ensure high-speed data transfer. However, the Mac's other limitations, such as CPU and bus speed, still affect Hustler performance somewhat, as the results show.

By Mac Model

Shorter bars are better.

These tests show the file-transfer times between a Mac-based BBS and different Mac models over dial-up telephone connections.

File-Transfer Rate (in seconds)

AT 57.6 Kbps				AT 38.4 Kbps				AT 19.2 Kbps			
Graphics File (2418K)		Text File (523K)		Graphics File (2418K)		Text File (523K)		Graphics File (2418K)		Text File (523K)	
Power Mac 7100	560	100		676	146			1337	291		
Centris 650 w/Hustler card*	553	63		*	*			*	*		
Mac II w/Hustler card*	581	102		*	*			*	*		
Mac II	581	103		690	150			1342	292		
LC	581	104		689	150			1345	296		
Classic	916	199		945	203			1344	308		

*We tested Hustler card transfers only at 57.6 Kbps.

By Chip Set

Rate to transfer file in bits per second.
Longer bars are better.

These tests show the capabilities of modems based on the major V.34 chip sets. Not all modems using a particular chip set will show the exact same results, but these differences are representative of most modems using a particular chip set. Throughput shows the average rate achieved, while Connect Rate shows how often modems could achieve the 28.8-Kbps rate over the range of typical telephone connection quality levels.

Average Throughput (in bps)

MIXED NETWORKS				MODERN NETWORK (digital)				OLDER NETWORK (analog)				Connect Rate (percentage of 28.8-Kbps connections)	
Text File (327K)		Archive File (524K)		Text File (327K)		Archive File (524K)		Text File (327K)		Archive File (524K)		Text	Archive
Motorola	80.1	33.0		82.4	33.9			62.2	25.7			85%	87%
Rockwell	84.7	32.3		82.4	34.6			73.5	31.7			91%	85%
AT&T	66.5	26.0		80.9	33.7			62.2	19.8			41%	16%

BEHIND OUR TESTS

To test transfer rates, Macworld Lab set up a FirstClass BBS on a Centris 650 with a Hustler card and an Archtec SmartLink 2834A modem installed to ensure top performance for the BBS server. We then dialed in to the server from several Macs and transferred files. To test throughput, Macworld Lab used a telephone-network simulator from P.T.T. that is designed to simulate the phone-line conditions of 95 percent of U.S. lines. Using the Telecommunications Industry Association's TSB38A test suite, we then measured the

throughput for file transfer over those simulated lines. We also broke out the results for modern (digital) lines and older (analog) lines so users can gauge the performance of different chip sets in the two likeliest ranges of line conditions. For the Motorola chip set we used a Motorola V.3400, for the Rockwell chip set we used the Hayes SmartModem Optima, and for the AT&T chip set we used the E-Tech Bullet 100E.—**Macworld Lab testing supervised by Matt Clark**

plus connect charges of 4 cents for the first minute and 3 cents for each additional minute. Figure anywhere from \$500 to \$1000 for the Mac interface card and other related hardware. (For more on ISDN, see "ISDN Heats Up," in *Net-works* news, *Macworld*, April 1995.)

If you want to send digital data from an ISDN line to other people, the recipients must have either a digital connection or an interface. Some digital modems let you connect to both digital and analog lines; examples are modems from Access-Works (908/888-4570) and Motorola (205/430-8000).

The Last Word

Still, ISDN modems are a bit off in the future for most people. If you use a modem for anything more strenuous than E-mail, sooner or later you'll benefit by upgrading to V.34. If you're an America

Online user, an Internet enthusiast on a SLIP or PPP connection, or a person responsible for supporting remote network routing or other WAN applications, the time to upgrade is now. If you're buying two or more modems that will mostly communicate with each other, it's best to buy all the modems from the same manufacturer so you can reap the benefits of identical features and fastest possible modem-to-modem data rates.

If you use applications for which connecting at the highest throughput rate is always critical, avoid the lowest-price modems. To develop a modem that performs as fast as the Motorola-based modem in our testing, a vendor needs to use high-quality components throughout and normally can't make a profit in the low-end consumer market.

If you choose to buy before the end of this year and you want your equipment

to stay state-of-the-art, choose a model with flash ROM so you can upgrade by downloading new code from a manufacturer's BBS. It's certain that bugs will be found in implementations and that vendors will write new code. It's much more convenient to upgrade through flash ROM than by sending your modem back for a chip-set replacement.

It's too soon to pick the best V.34 modem—only time will tell which modem makers produce the best implementations. But it's clear that V.34 modems will benefit a great many people—some now, and many more later—and vendors are poised to deliver them at affordable prices. **m**

JEFF ANGUS has written extensively about modem technologies for several magazines, including *Macworld's* sister publications *PC World* and *InfoWorld*.



"But They Said My New Macintosh Would Run Windows Applications."

It's a crying shame. You thought your new Mac could run Windows applications right out of the box, but it doesn't. Well, dry your eyes, because even though they forgot to sell you the software you need, you're not out of luck. Just get SoftWindows.

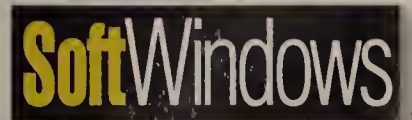
SoftWindows lets you run the standard mode Windows applications you need at work or at home. With a couple of clicks, you can access databases in dBase. Edit spreadsheets from Excel or Lotus 1-2-3. Exchange documents, presentations, even access your company's e-mail, printers and networks.



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and MS-DOS 6.21

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Circle 68 on reader service card

T Y P E

The latest crop of typefaces shows style, energy, and pizzazz. Macworld picks some first-class newcomers.

It wasn't easy picking a handful of noteworthy new typefaces to write about. Not that I'm complaining, mind you—I love leafing through type catalogs, installing dozens of new fonts, and fading out a laser-printer toner cartridge or two from printing samples. It's just that there are so many good faces to choose from.

With hundreds of new faces released in the last year, where does one begin? I called a number of digital type foundries and asked which of their new faces they were most enthusiastic about. I then surveyed several type experts and asked them what they would choose as exceptional, new faces. Finally, I studied this information and came up with my own list of faces that I think are excellent examples of the following styles: text, handwriting, script, display, and a couple of interesting faces that escape conventional classification.

Text

Adobe Jenson This new text face has roots in the fifteenth century; it was inspired by a beautiful Venetian Roman face created in 1470 (about 20 years after the advent of movable type) by Nicolas Jenson. It may seem odd that typographic fashion has changed so little in the last 500 years, but look at the pleasing pro-

portions of Adobe Jenson's letterforms and you'll probably agree it would be hard to improve on this master typefounder's work. Adobe Jenson is a comfortable face to read; the eye never stalls on an awkward letter. The family's italics, which are lovely in their own right, are based on italic faces of Ludovico degli Arrighi, a Roman printer of the sixteenth century.

Font designer Robert Slimbach used photographic enlargements of Jenson's and Arrighi's books to design his version of Jenson. While Nicolas Jenson cut only one size of type, Adobe Jenson uses Multiple Master technology to adjust optical size so it's appropriate for different point sizes. Adobe Jenson also provides a design axis for weight, allowing you to generate faces from light to bold. The family includes Roman, italic, and swash italic styles, as well as Roman and italic expert sets with small caps, fractions, superior and inferior numerals, and extra ligatures.

Adobe Jenson, which I saw in prerelease form, is one of the finest digital typefaces I've seen. This revival would be an excellent choice for setting a book; its classical proportions and even texture make it easy to read—even in lengthy passages—and you can tailor weights and optical sizes to your printing needs.





by Erfert Fenton

Jenson will be available later in 1995. Distributor: Adobe Systems (415/961-4400) and other vendors of the Adobe Type Library. List price: Adobe has yet to determine this.

Monotype Bulmer Another revival is Monotype's Bulmer family. Monotype Bulmer is based on the foundry's 1930 hot-metal version of Bulmer, which itself was based on types cut by William Martin in 1790 and named after William Bulmer, a renowned English book printer in the late-eighteenth century.

The digital Bulmer was drawn by Ron Carpenter, who studied Bulmer's printed works and surviving metal versions. Bold and semibold weights, an expert set, alternative characters, and display fonts were added to the original design, for a total of 28 fonts. A QuickDraw GX upgrade will be offered free to registered users (in the happy event that any applications ever support GX fonts).

Monotype Bulmer's even color and compact look make it a good choice for lengthy passages of text such as books, reports, catalogs, and the like. It's a strong, no-nonsense face that conveys a sense of solidity.

Distributor: Monotype Typography (312/855-1440). List price: Monotype

Chapter 19

*A pleasant day, with
an unpleasant Termination*

The birds, who, happily for their own peace of mind and personal comfort, were in blissful ignorance of the preparations which had been making to astonish them, on the first of September, hailed it no doubt, as one of the pleasantest mornings they had seen that season. Many a young partridge who strutted complacently among the stubble, with all the finicking coxcombry of youth, and many an older one who watched his levity out of his little round eye, with the contemptuous air of a bird of wisdom and experience, alike unconscious of their approaching doom, basked in the fresh morning air with lively and blithesome feelings, and a few hours afterwards were laid low upon the earth.

Adobe Jenson

ABCDEFGHIJKLMNOPQRSTUVWXYZ
W XYZabcdefghijklmnopqrstuvwxyz
&1234567890

Bulmer family (ten weights and styles) \$250; Monotype Bulmer Expert Set \$70.

Handwriting

Eaglefeather Whether you know it or not, you've probably seen David Siegel's work. His Tekton handwriting font is immensely popular, appearing on ads, menus, brochures, and anywhere a handwritten look is desired.

Siegel's latest typeface, Eaglefeather, is based on the hand lettering used by Frank Lloyd Wright on his design plans for a Southern California estate around 1920. From an initial sample of 19 letters, Siegel and type designer Carol Toriumi-Lawrence created a 15-font type family comprising three weights—light, regular, and bold—and complementary italic weights for Eaglefeather Formal and Informal, as well as three weights of small caps. According to Siegel, Eaglefeather “has a more formal, draftsman-like look than Tekton, yet preserves the ‘blobs’ left at the end of each stroke by a

technical pen.” The double bars on the *A* and *H* give the face a stylish, Art Deco look, but they do not overwhelm the rest of the letters. The escalator-shape uppercase *S* may be a bit much for some people, but Siegel defends it as being true to the face's origins.

Eaglefeather has too much personality to be used as a general-purpose handwriting face like Tekton, but you can employ it where a readable but distinctive hand-lettered look is called for. Use Eaglefeather for display type, posters, notes or letters, menus, ads, initial caps or other design elements—or even architectural drawings.

Distributor: Agfa Type (508/658-5600, ext. 2131). List price: Formal family \$210; Informal family \$210; Small Caps \$105; single weights \$45 each. (Eaglefeather is a trademark of the Frank Lloyd Wright Foundation. A portion of the sales of Eaglefeather supports the conservation and education programs of the foundation.)

O b e r o n

What thou see'st when
thou dost wake,

[*Squeezes the flower on
TITANIA'S eyelids*]

Do it for thy true-love
take;

Love and languish for
his sake:

Be it ounce, or cat,
or bear,

Pard, or boar with
bristled hair,

In thy eye that shall appear
When thou wakest,

it is thy dear:

Wake when some vile thing
is near.

Monotype Bulmer

ABCDEFGHIJKLMNOPQRSTUVWXYZ
VWXYZabcdefghijklmnopqrstuvwxyz
vwxyz&1234567890

Script

Sloop With 20 years of experience as a calligrapher, it's no surprise that Richard Lipton was able to invest Sloop with a fluidity that evokes pen strokes, not pixels. Inspired by the hand-lettering style of calligrapher Raphael Boguslav, the face's swirls and arabesques are a delight to behold. Sloop is not a single font but a set of three related fonts—Sloop One, Two, and Three—that offer different degrees of ornamentation. Sloop One's lowercase letters have relatively short and straight ascenders and descenders; Two's ascenders and descenders are longer and more curved; and Three's are longer still, which results in many overlapping curves. While you can simply type a line in any of the three variants, for best results you'll want to combine letters from each font (a line set in Sloop Three, for example, might look too busy, with a jumble of overlapping ascenders and descenders).

Setting type in Sloop requires work; you must experiment to see which com-

EAGLE

ABCDEFGHIJKLMNOPQRSTUVWXYZ
 Zabcdefghijklmnopqrstuvwxyz&123
 4567890

FEATHER

Eaglefeather

Prairie Style
 Prairie Style
 Prairie Style
 Prairie Style
 Prairie Style
 Prairie Style
 Prairie Style
 Prairie Style

My Little Gigabyte

My Little Gigabyte

My Little Gigabyte

My Little Gigabyte

Sloop

ABCDEFGHIJKLMNO
 PQRSTUVWXYZ Zabcdefghijklmnopqrstuvwxyz
 ijklmnopqrstuvwxyz&1234567890

binations of Sloop One, Two, and Three look best, adjust kerning between fonts, and try out alternate characters. However, the results should be worth the effort.

Sloop is impractical for lengthy publications, but it's ideal for book covers, invitations, announcements—anything meant to convey taste and elegance.

Distributors: The Font Bureau (617/423-8770); FontHaus (203/367-1993); FontShop (800/897-3872). List price: One, Two, and Three \$105.

Display

Nueva Nueva is a new Multiple Master typeface from Carol Twombly, the versatile Adobe type designer who is perhaps best known for her incomparable—and nearly ubiquitous—Lithos. Twombly began making sketches for Nueva in 1988, envisioning a complementary lowercase for her Charlemagne titling face, then resumed work on it years later, when it evolved into a contemporary, almost whimsical design.

Since Nueva is a Multiple Master design, its personality varies depending on the combination of weight and width you specify, evoking anything from Latin to Art Nouveau to 1950s lettering styles.

While it's basically a lively face, with arches springing from tapering stems, Nueva has an underlying harmony that makes it pretty enough to use for setting, say, a short poem. Nueva is meant to be set at 16-point or larger, making it suitable for display applications such as book jackets, posters, greeting cards, and so on.

Distributors: Adobe Systems (415/961-4400) and other vendors of the Adobe Type Library. List price: \$105; Adobe Type on Call \$69.

Nontraditional Type

Proforma Utilitarian yet attractive, the 24-member Proforma family was originally designed in the late 1980s for a Danish manufacturer of computerized forms systems. The Font Bureau began selling it in 1994. Proforma is tailored for

use in forms and tables; its narrow characters are ideal for fitting copy into small spaces. Designer Petr van Blokland describes Proforma as a “heavy-duty typeface”: its squarish serifs and robust stem weights enable it to hold up even at small sizes under poor printing conditions, such as inferior-quality paper. Yet for all its practicality, Proforma is pleasing to the eye. (Proforma was recently nominated for the Rotterdam Design Award.) With its many styles and weights—from ultra-light to bold—it could easily be used as a corporation's in-house typeface, appearing in forms, reports, presentations, promotional materials, brochures, and more.

Distributor: The Font Bureau (617/423-8770). List price: \$40 per style or weight; \$35 per font for three to five styles; \$30 per font for six or more styles. (Prices listed are for single-user license; contact The Font Bureau regarding pricing for multiuser or site licenses.)

Marcus Aurelius While berated by type cognoscenti as “grunge fonts,” the

efghij

Nueva

aaa aaaa aaaa

ABCDEFGHIJKLMNOPQRSTUVWXYZ

abcdefghijklmnopqrstuvwxyz

&1234567890



Marcus Aurelius

Dishtowels 'n' More, Inc.

QUARTERLY REPORT

4th Quarter 1995

Dear Stockholder:

We are very pleased to inform you that 1995 has been a banner year for the dishtowel industry. Sales increased by 23% in the first quarter alone. And the vigorous public-awareness campaign by the President's Council on Kitchen Hygiene has helped boost our company's sales to a whopping 234,698,147 units this fiscal year! I think you will share my enthusiasm when you read the attached report.

Robert Grimes

President, D'n'M, Inc.

Proforma

ABCDEFGHIJKLMNOPQRSTUVWXYZ
W XYZabcdefghijklmnopqrstuvwxyz
vwxyz&1234567890

type illiterati (not to mention a large number of innovative professional designers) seem to love the new crop of wacky fonts from small upstarts such as the Chicago-based T-26. The folks at T-26 don't seem too concerned about criticism from the establishment; their fonts have names like Scrawl, Garbage, and Out-haus. Although I've been known to go into curmudgeonly tirades myself while trying to read some of the hip new 'zines that favor the newly fashionable faces, I enjoy using them for my own projects. I just used Mark Allen's Marcus Aurelius to create a business card, for example, and I'm very pleased with the results.

Legibility is not the aim of Marcus Aurelius and its ilk; getting noticed is. You can go out on a limb and use T-26

fonts in your designs, or you can play it safe and use Adobe's Lithos, a sublime, timeless face that has become a victim of its own appeal and trickled down to pizza-parlor signs and potato-chip bags. Use Marcus Aurelius for anything you want . . . well, almost anything—do me a favor and don't set an entire article in it.

Distributor: T-26 (312/670-8973). List price: \$39.

Finding Your Own Faces

Good type abounds; the difficulty is choosing the right face for the right purpose. I've touched on merely a cross section of fonts for a variety of uses, thereby leaving out many a good foundry and designer.

If this introduction piqued your curiosity, you might want to do your own

research. For the latest information on type, you can purchase ITC's Directory of New Typefaces (212/371-0699, \$250 per year), a catalog of ITC-approved faces that includes type samples, notes on designers, and buying information for faces from more than two dozen foundries. You could also benefit from checking out some of the small type-design shops such as Alphabets (800/326-8973), Carter & Cone Type (617/576-0398), Galapagos Design Group (617/497-5626), or Stone Type Foundry (415/324-1870). With a little determination, you're likely to find just the gem you're looking for. **m**

Contributing editor ERFERT FENTON is currently working on the third edition of *The Macintosh Font Book* (Peachpit Press).



WHEN

Hey, if you weren't intelligent, you wouldn't have that important job of yours.
And it's always good to have a color printer that can keep up with your ideas.

SMARTER

That's where the QMS® *magicolor* Laser Printer comes in.
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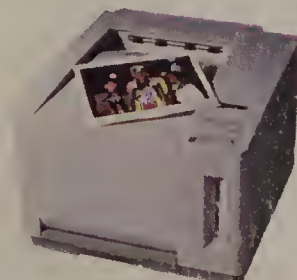
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Representatives from three of the leading tape mechanism types: Optima Technology MiniPak F8000DAT (DDS-2), Tecmar's Data-Vault 2000 (DDS-1), and Club Mac's Exabyte 8505XL (8mm).



Successful Workgroup Backup

T

he ideal backup solution would bring angels down from on high every night to copy all of your data with no human intervention. You could rest easy, knowing that Providence had you covered. Unfortunately, in the real world you need to do it yourself. But take heart; with the right preparation, you can create and implement a backup strategy that will be easy to use and will protect your data from the cold, cruel world.

Effective backups start with solid planning. Consider how much storage capacity

you'll need; how fast your backup device must be; which computers need to be backed up, and how often; and the ease of setup for your backup software. You also have to consider human factors. It seems that people can always find reasons to skip backing up, so come up with a plan that overcomes inertia and gets the job done.

For most companies, tape backup makes the most sense from a capacity and cost standpoint. To help you devise an effective backup strategy, Macworld Lab tested the leading tape-drive mechanisms and backup software for speed and ease of use. We explain which mechanisms fit each backup need and pass on tips that will help you to avoid common pitfalls.

Building a Strategy

Start with the basics. First determine which computers in your organization must be backed up. That's easy: all of them. Then prioritize your Macs to ensure that the most important machines get the most attention. Iden-

A

GOOD PLAN

AND A

GOOD TAPE DRIVE

ARE KEY.

MACWORLD LAB

HELPS

YOU PICK BOTH.

by Tom Negrino

tify the machines that need to be backed up every day to protect your business. File and E-mail servers are the obvious choices, but don't forget the bookkeeper's Mac, the sales manager's Mac, and if you're in a graphics business, the Macs in the art department. And don't overlook the boss's computer.

Inventory each computer, noting its name, the size of its hard drive(s), what kind of network (LocalTalk or Ethernet) it is attached to, the name of its network zone, and the machine's physical location. Especially in larger companies, actually go and see every computer; you don't want to end up backing up a computer that is on your network zone but is physically located in a far-off location. Imagine the phone charges if you tried to back up a company server in Australia.

With a complete computer inventory, you'll be able to figure out how much backup capacity you require. Add up the size of each hard drive. Take the total, and multiply it by 1.5, as a prudent estimate of future growth. The result is your *backup-capacity requirement*.

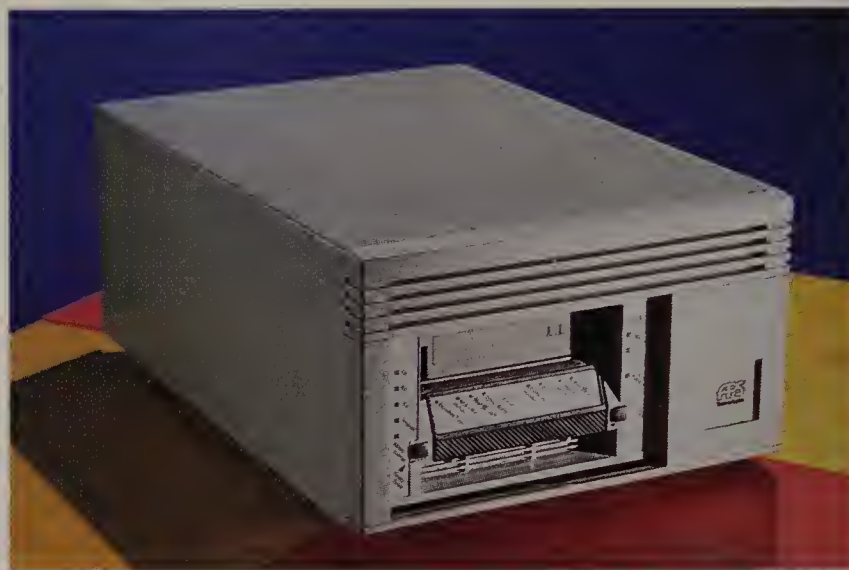
Next you need to figure out how long a full backup will take. Take the backup-capacity requirement and multiply it by 1.5, to account for the extra data sent over the network when your backup software verifies the backed-up data. This figure is called the *total data transmitted*. Divide this figure by the network-throughput number to get the total number of hours needed to complete your backup.

For backing up one computer, speed may be a critical concern—particularly if you back up often or do so during working hours. For network backup, the equation changes. LocalTalk throughput is typically about 1MB per minute (MBpm). If you're using Ethernet, the estimate is a bit more involved. Macworld Lab found that the speed of the Mac you're using makes a big difference in Ethernet throughput, with a Power Macintosh 7100/66 transferring data almost three times as fast as a Mac IIci (12 MBpm versus 4.5 MBpm). For a mix of fast and slow Macs on a network, use an estimate of 10 MBpm to 15 MBpm. (Remember, however, to tell users to unmount any external drive that is not being backed up. Mounted volumes can slow network backup due to AppleTalk polling.)

When connected via SCSI, nearly all the mechanisms we tested easily exceeded the speed of an Ethernet network. So for network backup consider capacity as key. Make sure that the mechanism you select will handle all the data you have to back up without changing tapes, so that the backup software can handle the process automatically. Let's say you have

20 Macs to back up, each with an 80MB drive, plus a 2GB file server. With verification, that's 5.4GB of data passing over the network, and at Ethernet speeds, you'll need up to 9 hours to complete a full backup.

You can speed backup time considerably by connecting the tape drive directly to the file server, which usually has the majority of data that needs to be backed up. That machine will back up at SCSI



APS's prototype based on a superfast DLT mechanism.

speeds—up to 30 MBpm for a tape drive based on a DDS-2 DAT mechanism (the fastest DAT we tested)—100 minutes for the entire server. This makes DDS-2 an appealing choice for small-to-medium-size networks. With the tape drive directly on the file server, the sample network noted above would take roughly 5.5 hours to back up. (But don't hook up your tape drive to your mail server. During backup it would bog down mail delivery.)

After doing the research and the arithmetic, you have the basic information to make an informed decision on which class of tape-backup mechanism to buy for a full, unattended backup. Now move to the next step.

Sizing Up Your Choices

Tape drives hold at least 1GB of data—enough for most single users and many small workgroups—and you can find tape units that handle up to 100GB. (For modest backup needs, consider a removable-cartridge drive or regular hard drive; see the sidebar “Backup Alternatives.”)

Many vendors sell drives, but only a handful of manufacturers build them. Resellers buy a mechanism and case and add backup software (in nearly all instances Retrospect, which is \$249 if purchased separately from Dantz Development Corporation, 510/253-3000). Macworld Lab tested representative drives from resellers of the leading DC2000, DAT, 8mm, and DLT drive mechanisms. We also tested network-

backup software for speed, ease of use, and reliability.

To discover the raw speed of the mechanisms, Macworld Lab tested them in single-user mode using Retrospect (see the test results, “Tale of the Tape”). We backed up and restored a nearly 200MB mix of small files, and a 423.5MB QuickTime movie. For almost all mechanisms, we saw only a small difference in performance between backup and restore.

Any product from any vendor should perform nearly the same as the mechanism it is based on (see the table, “Tape Options at a Glance”). However, each manufacturer makes a number of versions of each mechanism, which may vary in performance. In the DDS-1 and DDS-DC categories, those variations

were minimal. But in the DDS-2 category, differences between versions were up to 8MB per minute, depending on the operation. For top speed, look for a top-ranked version of that mechanism.

Remember also that a faster Mac will improve performance. We spot-checked the fastest DDS-2-based drive on a Power Mac 8100/110; it performed substantially better than on the Centris 650 for small-file backup and restore.

Mechanism Options

The choices for drive mechanisms appear below in increasing order of capacity.

DC2000 The DC2000 minicartridge was the first tape-backup format for the Mac, but the DC2000 has been moribund for several years due to slow speed and limited capacity. A new generation of DC2000 drives has revived the format; Exabyte is shipping a fast, 1GB unit, and other manufacturers are expected to follow suit.

With average transfer rates better than 25 MBpm, the Exabyte DC2000 is the fastest shipping unit tested; that's a surprise, considering the sluggish performance of earlier versions of this mechanism. These new drives are expected to fill the void on the low-price end of the market, with street prices between \$450 and \$650. Exabyte also has a unit with hardware compression, rated at 2GB capacity (not tested for this article).

DAT The most popular tape format for the Mac today is DAT. Fast and capa-

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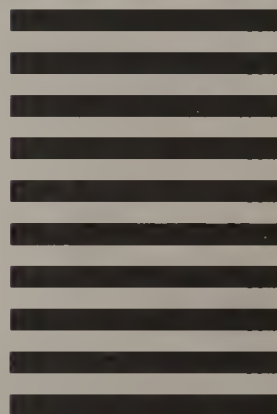
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cious, DAT was developed from the audiophile digital audiotape format. DAT drives come in several different flavors. The basic unit is known as Digital Data Storage-1 (DDS-1), and it holds 2GB of data on a 90-meter tape that fits easily in the palm of your hand. The DDS-DC version adds hardware-based data compression and fits up to 4GB on the same 90m tape. The new high-end DAT standard, DDS-2, increases capacity by using longer (120m) tapes. With their built-in hardware compression, DDS-2 drives pack up to 8GB on a 120m tape.

According to our tests, DDS-1 backs up at about 10 MBpm; DDS-DC drives clock in at about 12 MBpm; and the DDS-2 units average more than 20 MBpm. There are many manufacturers of DAT mechanisms, and DAT prices range

from \$750 for a basic DDS-1 drive up to about \$1900 for some DDS-2 drives.

8mm 8mm drives are based on another consumer entertainment format, 8mm videocassette. Exabyte is the only maker of these drives, using Sony technology. An 8mm drive holds 2.2GB to 10GB of data, depending on data compression and model. The 8mm drives tested at about 22 MBpm with hardware compression, and about 13 MBpm without. These drives, which run from about \$1400 to \$2500, also work well for desktop video producers who want to transfer their work for broadcast (see the sidebar "Video Backup Specialists").

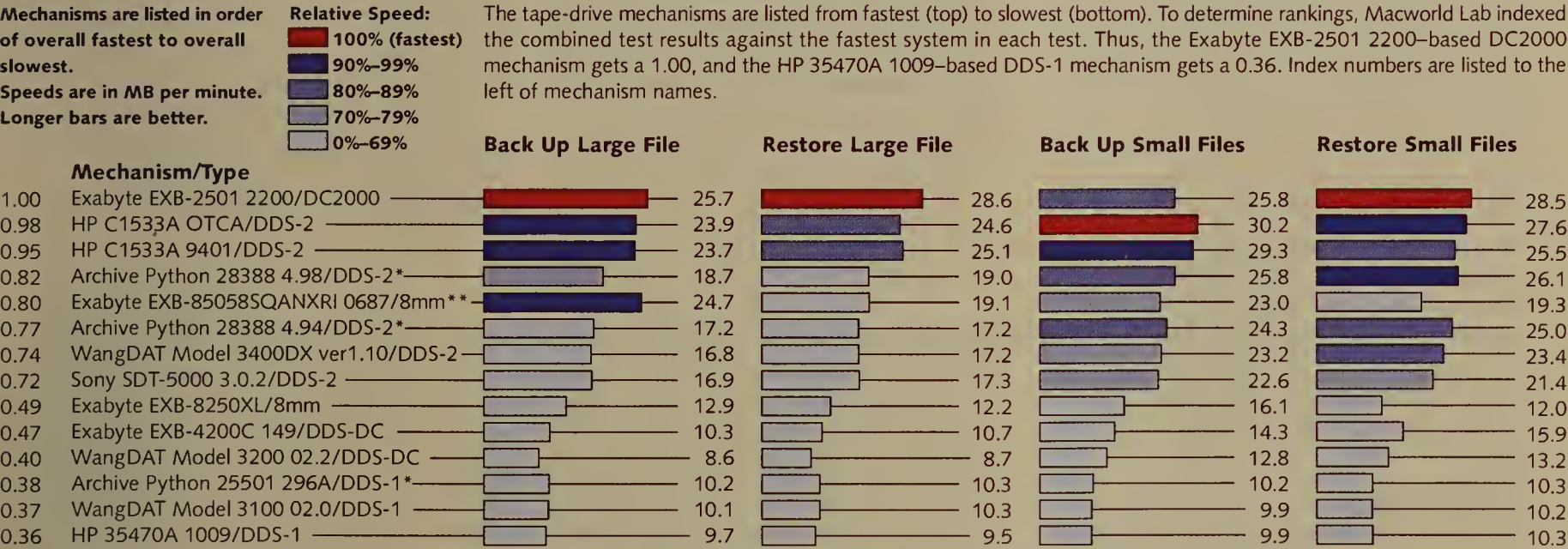
Digital Linear Tape The newest type of tape drive, expected to ship by the time you read this, is called DLT (Digital Linear Tape). Made by Quantum, DLT is

the fastest tape-backup device available for the Mac. Spot tests of prototypes showed data-transfer rates around 70 MBpm, fast enough that you need a Power Macintosh 8100 and a very fast hard drive to stream data to the DLT unit at top speed. In fact, you'll cause extra wear on the tape media if you transfer data at anything less than 40 MBpm, so DLT drives aren't recommended for network backup because networks can't transfer data that fast. The DLT's high speed comes with an equally high price tag; estimates range between \$4000 and \$5500.

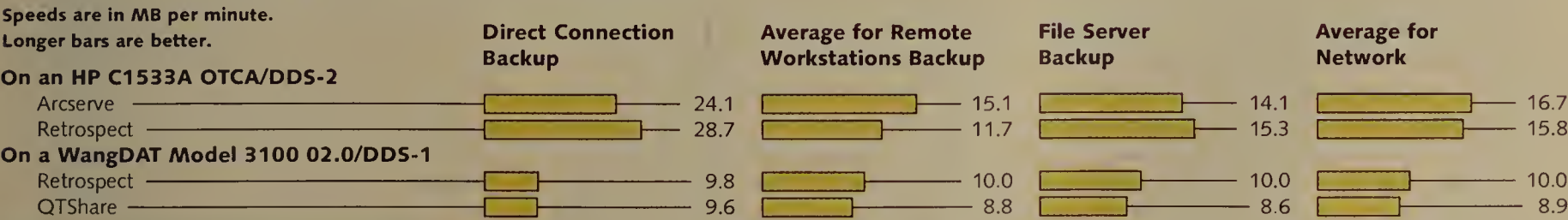
DLT comes in two models—10GB (standard) and 20GB (more hardware-based data compression). DLT makes the most sense for backup and archival storage of very large files, such as digital



Tale of the Tape



Network-Backup Software Compared



BEHIND OUR TESTS

Macworld Lab tested typical scenarios for single-drive and network-backup needs. To test raw speed (without slowdowns from the Finder and Mac file system) we backed up one large file—a 423.5MB QuickTime movie, from an external 1GB drive to the tape drive—then restored the file back to the same hard drive. We also backed up an assortment of 546 small files—totaling 198.6MB, from the internal 230MB drive of a Centris 650 to the tape drive—and restored the small files to the same hard drive. In all cases, Macworld Lab verified that access privileges (AppleShare and File Sharing) were correctly maintained on the restored machines.

Network tests were run on an Ethernet network consisting of five Macs—one IICI, three Centris 650s, and one Power Macintosh 7100/66. We used a Centris 650 as an AppleShare 4.0 file server with a nearly full 1GB hard drive. The remaining Macs served as clients; one of those (also a Centris 650) was

connected directly to the tape drive. The clients had between 120MB and 250MB to back up. One had File Sharing turned on, with access privileges set up for some other machines. We used the fastest DAT drive to back up the entire network for the Arcserve versus Retrospect trial, and a DDS-1 unit from Tecmar in the Retrospect versus QTShare trial (because QTShare operates only with Tecmar drives). Because the test was designed to simulate overnight backup, network traffic was minimal.

All test machines ran System 7.5 with standard Apple extensions. The test Macs were equipped with 8MB of RAM (except for the Power Mac, which had 24MB of RAM) and used 14-inch Apple Monitors with 8-bit color. Retrospect was used for all single-drive testing.—**Macworld Lab testing supervised by Mark Hurlow and Danny Lee**

video, prepress, digitized audio, and massive Photoshop documents.

Autoloaders For the largest backup needs, consider a tape autoloader, using either DAT or 8mm media. Autoloaders place 4 to 12 tapes into a cassette, automatically switching to a new tape when one fills up. Depending on backup software, you can also address each tape independently, so with the 6-tape Hewlett-Packard DAT mechanism, for example, you can dedicate 5 tapes to an incremental backup of each day of the workweek and use tape 6 as a weekly full backup.

The beauty of this system is that you only need to manually change tapes once a week. We looked at autoloaders made by Conner and Hewlett-Packard, which run \$2700 to \$4500, depending on the vendor. Tape-switching and Retrospect compatibility were reliable on both units.

Compression Most tape formats offer data-compression hardware to pack more data on a tape. When the data is restored, the process is reversed. Depending on how compressible your data is (text, database, spreadsheet, and bit-mapped graphics files are most compressible), compression lets you pack almost twice as much information on a tape. Drives with hardware compression also back up faster but cost more than drives without compression. Some backup software offers software-based compression, which is slower than backup without compression. Just how slow depends on the speed of your Mac; a good rule of thumb is that a backup with software compression will take half again as long as a backup without compression.

Matchmaking

If you are backing up a single workstation with a gigabyte or less of data, you fall into the personal-backup category, and you should buy a DDS-1 DAT or DC-2000 unit. If you need to back up just a few hundred megabytes, take a look at a removable-cartridge system. You'll also need a backup program. Nearly all tape drives ship with Retrospect, making it the de facto standard in backup software.

A workgroup, with 1GB to 2GB to back up, can also use a DDS-1 or DC2000 drive but should mainly look at a DAT drive with hardware compression or an 8mm drive. If you have 3GB to 5GB of data, and if backup speed is a big consideration, a DDS-2 DAT is a better option. The largest workgroups need a DAT or 8mm autoloader. They also need a network-backup program, which designates the Mac with the attached tape drive as the backup server and the other networked Macs as backup clients. Dantz's Retrospect Remote (\$449 for ten users)

VIDEO BACKUP SPECIALISTS

As the line between desktop and broadcast video grows fuzzier, the 8mm Exabyte tape drive offers an important link for Mac-based animators and special-effects artists who produce for television or high-end presentations. The Abekas DDR (Digital Disk Recorder) is used in professional video-effects houses to create special effects and video animation. The Abekas supplies an 8mm Exabyte tape drive to back up its hard disk.

Knoll Software's (415/453-2471) \$199 Missing Link writes and reads Abekas format on 8mm Exabyte drives. With Missing Link, you can transfer numbered PICT or TIFF files, or QuickTime movies, frame-by-frame to 8mm tape in either NTSC or PAL Abekas format. Then take the tape to a postproduction facility for processing, where they play the tape onto the Abekas DDR. From the DDR, the video can be transferred to any videotape for-



mat with absolutely no loss in quality, since the entire process is digital. Missing Link also works fine in the opposite direction, so you can take original video footage, transfer it to the Abekas, back up the Abekas to 8mm tape, then read that tape's video contents into your Mac, where you can modify the images with Adobe Photoshop or any of the other Mac graphics tools.

Missing Link comes in Power Mac and 680X0 formats. It also reads and writes 8mm tapes in the Tape ARchive (TAR) format, used by Unix workstations. Some postproduction houses have a competing DDR, made by Accom. The Accom device reads Abekas-format tapes, so you can still use Missing Link to transfer your footage.

Another connection between 8mm tape drives and the Abekas and Accom DDR's comes from ASDG (608/273-6585) with its \$495 Abekas Driver.

fills the bill, as does Arcserve for Macintosh (\$245 for five users, from Cheyenne Software; 516/484-5110).

Software Differences Retrospect is the standard against which other packages are measured, and for good reasons: It supports virtually every backup medium, from floppy disks to the fastest tape drives. The program has excellent scheduling, automation, and scripting capabilities, and Retrospect Remote requires only a small extension on each client.

Retrospect 2.1 is Power Macintosh-native, and it supports SCSI Manager 4.3 (included with System 7.5) for the fastest data transfers. Macworld Lab's single-user tests showed that Retrospect is the fastest backup program for backing up a local workstation connected via SCSI, and the Lab's network tests found that Retrospect Remote backed up a DDS-2 system at an average of 15.8 MBpm over Ethernet.

Despite several revisions, Retrospect still has room for improvement, however. Many users find the program's interface confusing, with so many options as to seem overwhelming.

Cheyenne's Arcserve for Macintosh 1.5 is also Power Mac-native, and SCSI

Manager 4.3-compatible. Macworld Lab tests showed that Arcserve was a bit faster than Retrospect Remote at backing up remote workstations over an Ethernet network, with an average backup speed of 16.7 MBpm. Arcserve was actually slower for the Mac connected via SCSI and for the file server, but significantly faster than Retrospect for the Ethernet-connected Macs; so in large networks, the Arcserve advantage would grow.

Getting started with a backup system that uses Arcserve is a little easier than with one using Retrospect, because Arcserve's Quick Script feature provides scripts for full and incremental backups.

NetWare Expansion Unlike Retrospect clients, Arcserve clients can initiate a backup to a tape drive that is physically connected to another Macintosh. This allows any workstation to act as the backup administrator. With the optional Client Agent for Macintosh 2.01 software (\$495 per NetWare server for any number of users), Arcserve users on a mixed Mac-PC network can back up to a tape drive on a Novell NetWare network. Arcserve Mac tapes are also interchangeable with Cheyenne's Arcserve for Windows. At press time, Dantz had announced, but

not shipped, a Novell NetWare version of Retrospect Remote that would back up Mac and Windows clients and the NetWare server.

Retrospect backs up local (SCSI-connected) Macs faster than does Arcserve, so if you have a large file server to which the tape drive is attached and a small number of networked clients with small hard drives, Retrospect will give you better performance. Arcserve is faster at backing up networked clients, so it is a better choice for large workgroups—especially those without a big file server.

Arcserve is also less expensive. The single-user version of Retrospect is bundled with most tape drives. To add 10 users and turn the single-user Retrospect into Retrospect Remote costs \$449 list, or about \$260 via mail order. Arcserve costs only \$199 mail order for 15 users.

Completing Your Backup Plan

Software and hardware in hand, you're in the home stretch; all you need to do is decide how often to back up. First, find out how often your users modify documents that are critical to your business. Accounting files should be backed up every day, as should file and mail servers. You should note that a full backup—every

file on every Mac—is the longest kind of backup and should probably be done just once a week. Incremental backups, which copy only files changed since the last backup, should take place every day.

If there isn't a lot of activity on your company's computers, you might be able to get away with just a weekly full backup. Next, assess yourself. If you are the belt-and-suspenders type, you'll want to do full backups once a week and incremental backups every night. Make sure that your strategy includes periodic full backups of whole hard disks, not just backups of documents. With all of the system extensions and other productivity aids people add to their Macs, it's better to take some extra time and tape space to back up each workstation regularly. It'll mean faster recovery after a restore.

No matter how often you back up, designate a backup administrator. End users won't back up their own computers. It's that simple. The key to a successful backup strategy is to charge one person with the clear responsibility for backing up, then provide that person with the proper equipment and training to get the job done. And don't be stingy. You need to plan and implement your backup solution with the same care you would

take with any other activity that is essential to your business. Tapes are cheap. Rebuilding lost data is very expensive.

Making the Plan Happen

The hard part of your task is behind you; the actual backing up part is easy. For a workstation or a network, you need to create scripts in your backup software. This directs your drive and software to back up automatically, often while you're at home asleep. On Macs that support software control of power (most Mac II's, Quadras, and Power Macintoshes), Retrospect's client software will run a screen saver until that machine is backed up, then automatically shut down the Mac.

For network backup, connect the tape drive to the machine you've previously designated as the backup Mac (usually your AppleShare file server). Install the network-backup software on the backup Mac, then install the client software (with Retrospect, it's just a small system extension) on each client Macintosh. Open the application on the backup Mac and verify that the program can see each client. Then create your backup scripts. Once a script is complete, run it once as a test.

Create several backup sets of your data, updated over a period of days or

Tape Options at a Glance

Company	Phone	Toll-Free Phone	Mechanism Types Sold (manufacturer)	Maker of Included Software	Warranty (in years)
APS	816/483-6100	800/235-2753	DAT (Conner), DLT (Quantum)	Dantz	2
Club Mac	714/768-8130	800/258-2622	8mm (Exabyte), DAT (Sony), DC2000 (Exabyte)	Dantz	1 (Exabyte), 2 (Sony)
Contemporary Cybernetics Group	804/873-9000	none	8mm (Exabyte)	varies	2
Dynatek	416/636-3000	none	DAT (Sony)	Dantz	1
Exabyte	913/492-6002	800/392-2983	8mm (Exabyte), DAT (Exabyte), DC2000 (Exabyte)	Exabyte	2
FW8	415/474-8055	none	DAT (WangDAT), DLT (Quantum)	Dantz	1
Hewlett-Packard	415/857-1501	800/826-4111	DAT (Hewlett-Packard)	Dantz	1
La Cie	503/520-9000	800/999-0143	DAT (Conner), Teac (Teac)	Dantz	1
Legacy Storage Systems	508/435-4700	none	DAT (WangDAT)	Dantz	1
Liberty Systems	408/983-1127	none	DAT (Conner, WangTek)	Dantz	1
MicroNet Technology	714/453-6100	none	DAT (Hewlett-Packard)	Dantz	1 (DDS), 2 (DDS-DC,DDS-2)
Microtech International	203/468-6223	800/626-4276	DAT (WangDAT)	Dantz	2
Mirror	612/830-1549	800/643-3374	DC2000 (Exabyte), DAT (Exabyte, Sony)	Dantz	1
Optima Technology	714/476-0515	none	DAT (Optima)	Optima	1
PLI	510/657-2211	800/788-9440	DAT (Sony)	Dantz	1
Procom	714/852-1000	800/800-8600	DAT (Sony)	Dantz	1
Qualstar	818/592-0061	800/468-0680	9-track (Qualstar), 3480 (Fujitsu)	Cyber-Comp	1
Relax Technology	510/471-6112	none	8mm (Exabyte), DAT (Conner)	Diversified I/O	1
Rexon	216/349-0600	800/422-2587	DAT (WangDAT)	Sytron	1
Tandberg Data	805/579-1000	800/826-3237	QIC (Tandberg)	Dantz	2 (drive only), 3 (full kit)
Transitional Technology	714/693-1133	none	8mm (Exabyte), DAT (Sony), DLT (Quantum)	Legato Networker, Dantz	2
Tulin Technology	408/432-9057	none	8mm (Exabyte), DAT (Hewlett-Packard)	Novastor, Dantz	2 (Exabyte), 1 (HP)

BACKUP ALTERNATIVES

Tape has no corner on the backup market. You can back up to removable disks of several kinds, or you can even back up to other hard drives connected to your Mac. In fact, if you have a gigabyte or less of data, consider a second hard drive for backup. A 1GB hard drive (about \$700) represents a fast, convenient way to back up.

SyQuest, Bernoulli, and magneto-optical (MO) removable disks are all good choices for backup under certain conditions. First, you should already have the removable-cartridge drive for another purpose, such as extra online storage, or for moving large files between your company and a service bureau. Tape drives cost less for backup than removable drives—after the hardware investment, tapes cost less than 2 cents per megabyte of storage, compared with up to \$1 for removable media.

Although you can back up with removable media simply by dragging files in the Finder, I strongly recommend investing in a backup program. Retrospect works fine with insertable media, but because backing up to disks is an easier proposition than to tape, there are also several other good backup programs. Redux Deluxe 2.5.1 (\$49 from Focus Enhancements, 617/938-8088) is a fast, easy-to-use program. Dantz has another good program, the \$125 DiskFit Pro 1.1. Surf Guard 2.33 (\$150 from Surf City Software, 714/289-8543) is worth considering.

You'll also find backup programs in Symantec Corporation's Norton Utilities for Macintosh 3.1 (\$149.95; 503/334-6054) and

MacTools Pro 4.0, from the Central Point Division of Symantec (\$99; 503/690-8090), but these are not as good as the other programs already mentioned. Norton Fastback and MacTools Backup are harder to use than DiskFit Pro or Redux Deluxe, and MacTools Backup requires intensive study of the manual to use properly. But if you already own one of these two Symantec packages and you're strapped for cash, it'll do.

For long-term (several years) archiving, a magneto-optical or WORM (write-once, read-many) optical drive works best. Optical drive media last longer on the shelf—up to ten years, versus five for magnetic media. The WORM drive is especially useful for data that is relevant to legal matters; the data can't be changed once written to the optical disk.

If your data is absolutely critical to your company's operations, such as a mail server or a product-inventory database, consider a disk-mirroring system. Sometimes called RAID (Redundant Array of Inexpensive Disks) Level 1, these systems use disk-formatting software (and, sometimes, a NuBus card with a second SCSI port) to read and write your data simultaneously to two hard drives connected together. (For more information on mirroring and other RAID systems, see "The RAID Option," *Macworld*, April 1995.) In any event, you can't base your entire backup strategy on a RAID system; you still need a conventional backup that will provide you with an off-site backup copy of your data in case of fire or other disaster.

weeks. One copy isn't enough. Although a bad backup is unlikely, it can happen.

It's simple to set up a rotating schedule for multiple backup sets. Here's a variation with four sets of backup tapes, labeled A, B, C, and D. First, in your backup software, create a backup script that does a full backup to the tape set labeled A on Friday evening. Then assign the script to add incremental backups to set A on the following Monday through Thursday. The next Friday, you start with a full backup to set B and send the set A tapes off-site for safekeeping. The third Friday it's set C's turn, set B goes off-site, and you bring set A back on-site, ready for its next go-around. Set D is an extra, full-backup set that you run on the first of every month.

A vital link in the data-safety chain is to establish a secure location for a copy of your data away from your company premises. Off-site backup is essential; the best backup plan will fail if your building burns down and all of your backup sets were locked in your desk and destroyed. It's best to establish a routine where the same person brings in the tape for next week's backup set on Friday morning, and leaves that evening with the tape from the current week's set. Arrange to put your off-site backup set in a bank safety-deposit box for optimum safety.

Once your backup plan is running smoothly, regularly test the integrity of

your backups. Periodically do a restore from your backups to make sure that your data is really OK; a rehearsal will also make restoration easier and less stressful when the real thing happens.

Another aspect of safety is wear and tear. As tapes wear out they suffer drop-outs, resulting in lost data (a good reason to have the Verify option turned on in your backup software). It's essential to retire your media before it goes south. If you use your tapes frequently, as you will if you're backing up daily, replace your backup set every six months.

While a tape is in service, the key to its longevity is proper storage. Put the tape into its case as soon as you remove it from the drive. Too much moisture and heat—more than about 125 degrees Fahrenheit—spells doom for tapes. To guard against disaster, buy a fireproof media vault for the media you keep on-site. Media vaults are different from the usual fireproof safes sold in office-supply houses, which keep paper documents from burning at about 450 degrees. Tapes melt at much lower temperatures. A \$150 to \$800 media vault can protect tapes even in a 1200-degree fire.

The Last Word

We've distilled the wealth of backup options into a few clear choices. Individuals can best back up with two types of tape drives: a DC2000 or a DDS-1 DAT.

Single users can also use removable drives or even a large hard drive. Workgroups will want to look at DDS-2 DAT drives. And large corporate sites should turn to a DAT autoloader.

Sooner or later, someone in your company will lose the data in a Mac, from hardware failure or from an accident like spilling a cup of coffee into the computer. When that happens, all the hard work you put into creating your backup and recovery plan will pay off. With a minimum of fuss and expensive downtime, you'll be able to recover the data and get things back on track. **m**

Contributing editor TOM NEGRINO is the author of *Upgrading Your Mac Illustrated* (Que, 1994).

TAPE DRIVE MECHANISMS



Macworld Lab tested drive mechanisms, not end-user products, so no Editors' Choice selection was made.

The performance of all products based on a particular mechanism should be nearly identical; users should consider the price, warranty, software, and support policies of each vendor before choosing between equivalent drives.

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Graphics

THE LATEST IN DESIGN, PUBLISHING, AND PREPRESS

Quark Extends Beyond Page Layout

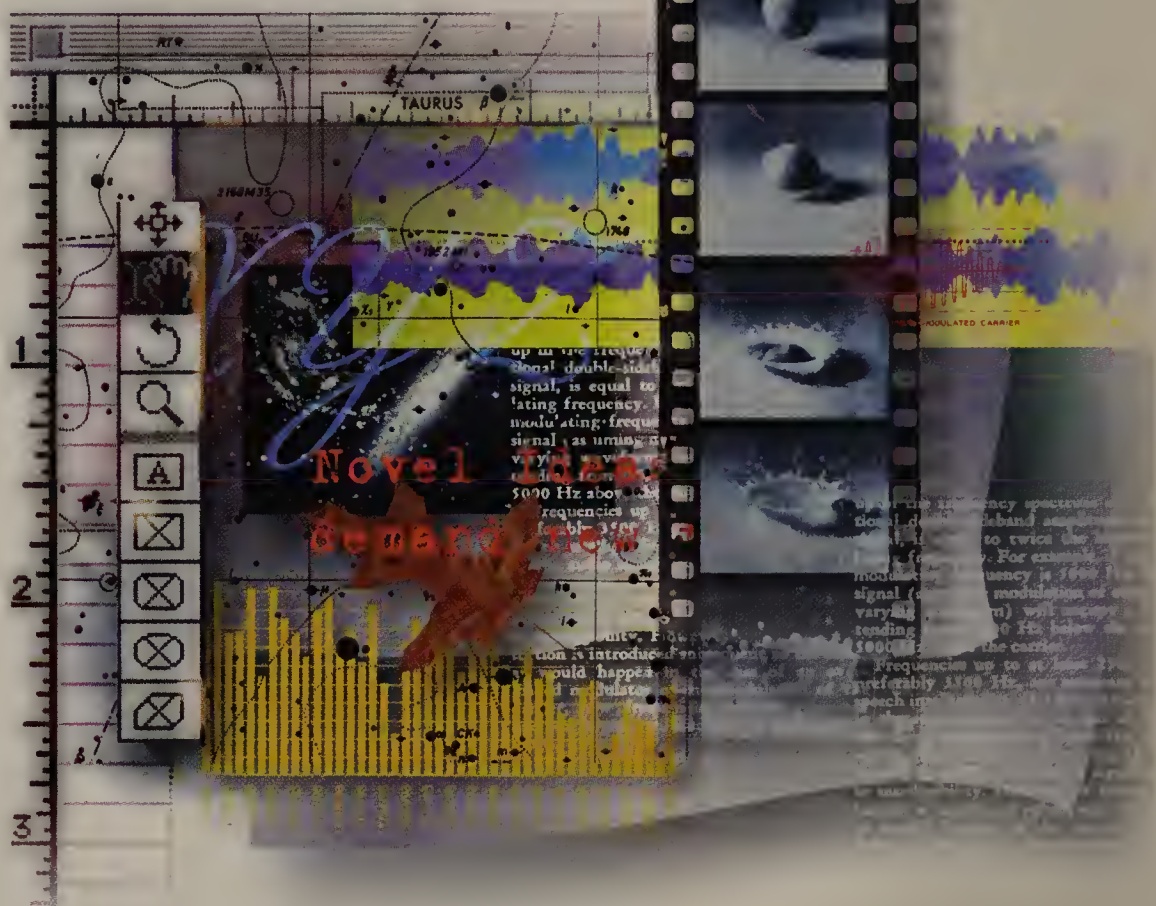


ARMED WITH AN INNOVATIVE XTension that can make any QuarkXPress file interactive and a powerful image editor, Quark is moving beyond its familiar page-layout arena to battle competitors on two new fronts. The new XTension technology, code-named Orion, will make it possible for QuarkXPress users to create interactive or online documents without switching to a multimedia program such as Macromedia Director—they'll be able to do it all within QuarkXPress. Meanwhile, on the image processing front, the company expects QuarkXPosure to lure Photoshop users to its ranks.

From Page Layout to Multimedia Orion will let you add audio, QuickTime 2.0 video, animation, hyperlinked text, and interactive buttons to any QuarkXPress 3.31 (680X0 or Power Mac) document, transforming it into a multimedia file for use online, in kiosks, on CD-ROM, or in any other screen-based presentations. You'll also be able to distribute, royalty free, a stand-alone viewer utility that lets any Mac or Windows PC user view your document.

To use Orion, you'll launch or create a QuarkXPress document; select a page element; generate a link in XPress's Utilities menu; and assign one of about 40 actions to the link, such as playing a movie or an audio clip, or running an Orion script, which strings actions together.

With Orion's Button Maker feature, you can import or create a graphic to serve as an interactive button in your document by simply dragging it onto a page—a pause button, for example, would let viewers temporarily stop QuickTime playback in an Orion presentation. Buttons aren't required for interactivity, though. Orion automatically transforms the cursor into a finger to signify a hot



JEFF BRICE

area; a button simply makes the interactivity more obvious to the viewer.

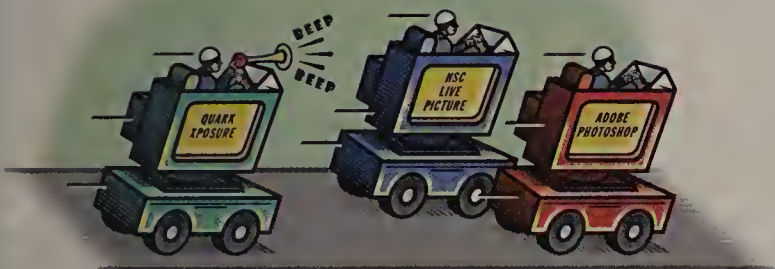
You'll have three options for exporting a finished presentation: as a single Orion viewer file, by including reference files (such as QuickTime movies) and choosing such settings as monitor bit depth, antialiasing, and QuickTime compression method and quality; as two files—with elements that require high-speed performance residing on the hard drive and those that don't, on a CD-ROM; or in HTML format for uploading to the World Wide Web on the Internet.

Orion, Button Maker, and the viewer utility should be available by midyear. The Orion XTension will be priced the same as QuarkXPress or will cost slightly

less if you buy QuarkXPress at the same time. Future versions of the product will include AppleScript support and the ability to create database links.

A New Image Processor Billing QuarkXPosure as an image processing program whose strong points are speed and flexibility, Quark is pitting its new image editor—for Power Macs only—directly against Adobe Photoshop, HSC Software's Live Picture, and Fauve's xRes. Like Photoshop and xRes, QuarkXPosure sports a full array of drawing, painting, masking, cloning, and retouching tools; but like Live Picture and Specular Collage, it doesn't apply your changes until you're ready to rasterize the file.

A key element of XPosure is its Operations palette, where each change you



make to an image is recorded and listed for you to see. You can change, undo, or reorder any operation you've applied by simply editing the Operations list; for example, to change the order in which you've applied two filters, you just drag one above the other in the list. The Snapshot feature lets you preview the different versions of an image described in the Operations list, so you can save revisions for comparison and then select the version you prefer.

Selection areas are called *lenses*—a lens contains a set of operations you've performed on an image, rather than a group of pixels that have been manipulated. A list of operations performed on an image can be exported in a small file; you can then apply those operations to a copy of the original file or in batch mode to other images that need similar corrections. Text is treated as just another object—you can manipulate or edit it at any time. You can also combine object-based paths with rasterized images.

Although you can directly edit high-resolution files, QuarkXPosure's offline editing feature allows you to edit a low-res version of a file, then apply those changes to the high-resolution version later in batch processing mode.

Along with providing built-in effects filters and brush options, QuarkXPosure

will support Photoshop plug-ins and will be integrated with QuarkXPress (XTensions developers will be able to add new tools and integrate new features into XPosure). It will also include color-separation and -correction technology developed by PixelCraft, as well as support for ColorSync 2.0. Due in mid to late summer, QuarkXPosure will list for \$895. The company is planning special pricing for QuarkXPress users. Quark, 303/894-8888.

—CATHY ABES AND JAMES A. MARTIN

GX Aids New Layout Programs



DESIGNERS AND PUBLISHERS will finally get a chance to explore QuickDraw GX's type and printing features with two GX-based page-layout applications—SoftPress Systems' UniQorn and Manhattan Graphics' ReadySetGo GX.

Developed by a British start-up, UniQorn takes full advantage of GX's intelligent outline-font data structure. For instance, you can stretch, rotate, and skew text; edit text on a path; and easily change a GX font's weight and width. And UniQorn's support of GX's extensible print architecture lets you print a document that contains pages in both portrait and landscape modes.

Unlike most layout applications, which employ separate text and picture frames, UniQorn lets you put text *and* graphics in the same frame. You can change the orientation of a page from landscape to portrait at any time—the dimensions of the frames adjust accordingly, and the text reflows automatically.

You get simultaneous multiple views of a document, including layout, galley (story-editing), and thumbnails. UniQorn automatically generates and names new styles based on the font and type size you've applied, listing them in a floating palette, and can apply styles at the character level.

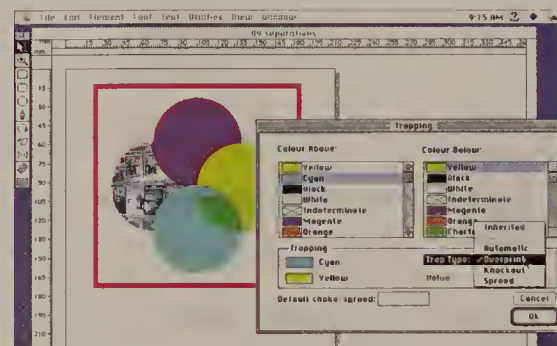
Because UniQorn can directly map styles to Hypertext Markup Language (HTML) tags, PostScript documents can be reformatted for publishing on a World Wide Web server.

IN BRIEF

■ **Live Picture 2.0** The latest version of HSC Software's Live Picture (\$995; see *MacBulletin*), which is due out by March, features color-correction and color-separation controls, batch processing, new positioning tools, faster processing, and lower RAM requirements (20MB). 805/566-6200.

■ **High-Power Color Servers** Radius's SplashMX (\$16,900), SplashMXplus (\$20,900), and SplashTX (\$26,900) Server Upgrades for Macintosh are network-based Mac workstations that—equipped with Adobe Photoshop, Acrobat, Color Central Open Prepress Interface (OPI) software, and RIP-based color correction—turn a Xerox Majestik color copier into a color printer, scanner, and proofer. 408/541-6100.

■ **Photoshop Image Enhancements** ColorMatrix, a \$295 plug-in filter from Total Integration, allows you to perform Scitex-level color correction within Photoshop. 708/776-2377.



UniQorn offers basic trapping of spot colors. You can closely inspect traps on screen by enlarging them; the program lets you override automatic traps as well.

UniQorn plays and records AppleScripts; QuickTime and OpenDoc support will be added later. A combined Power Mac-native and 680X0 version is due by late June. At press time, SoftPress did not have a U.S. distributor; the retail price will be in the \$700-to-\$900 range.

Meanwhile, ReadySetGo GX 7.0 is due to ship by early April in separate Power Mac and 680X0 versions (\$395 each). Version 7.0 incorporates standard GX type and printing features, with separate versions to support Arabic, Hebrew, and kanji. The non-GX version, 6.0, will still be available. Manhattan Graphics, 914/725-2048; SoftPress Systems, 011-44-1993-882588. —JAMES A. MARTIN



QuarkXPosure tracks your image manipulations (lenses) in a fully editable hierarchical operations list, while its snapshot feature provides a visual trail.

ViewSonic has become synonymous with providing superior high performance color monitors to a demanding industry. As a recognized price/performance leader, we are committed to designing outstanding monitors that continue to win awards. In fact, here are some comments from a few editors:



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"Best color quality, best sharpness and best versatility – what more could we ask of the ViewSonic 17? Frankly, we were surprised that one monitor could do it all."

– PC Computing; January 1994

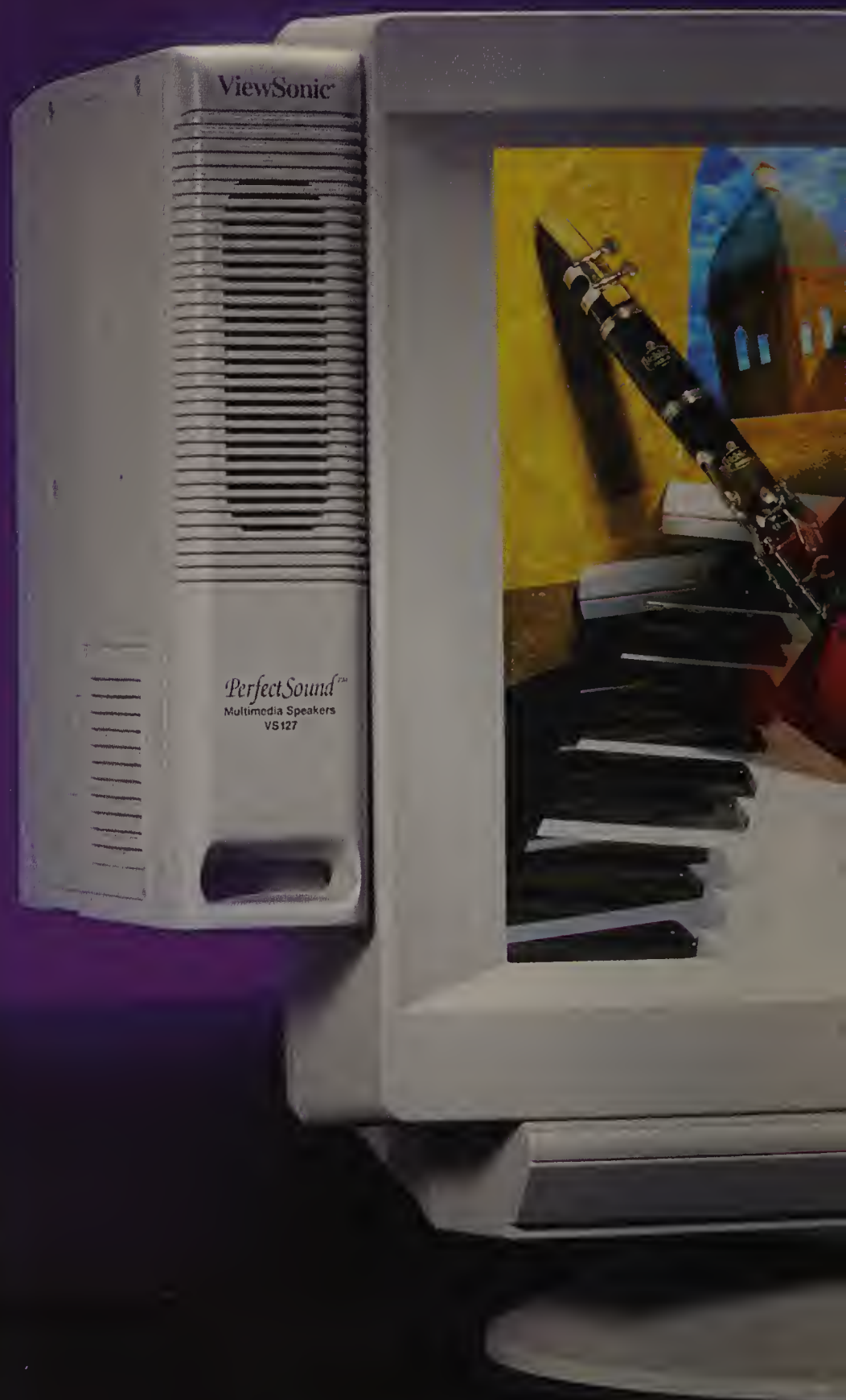


"ViewSonic has one of the sharpest, most detailed and well-focused displays around."

– Windows; September 1994

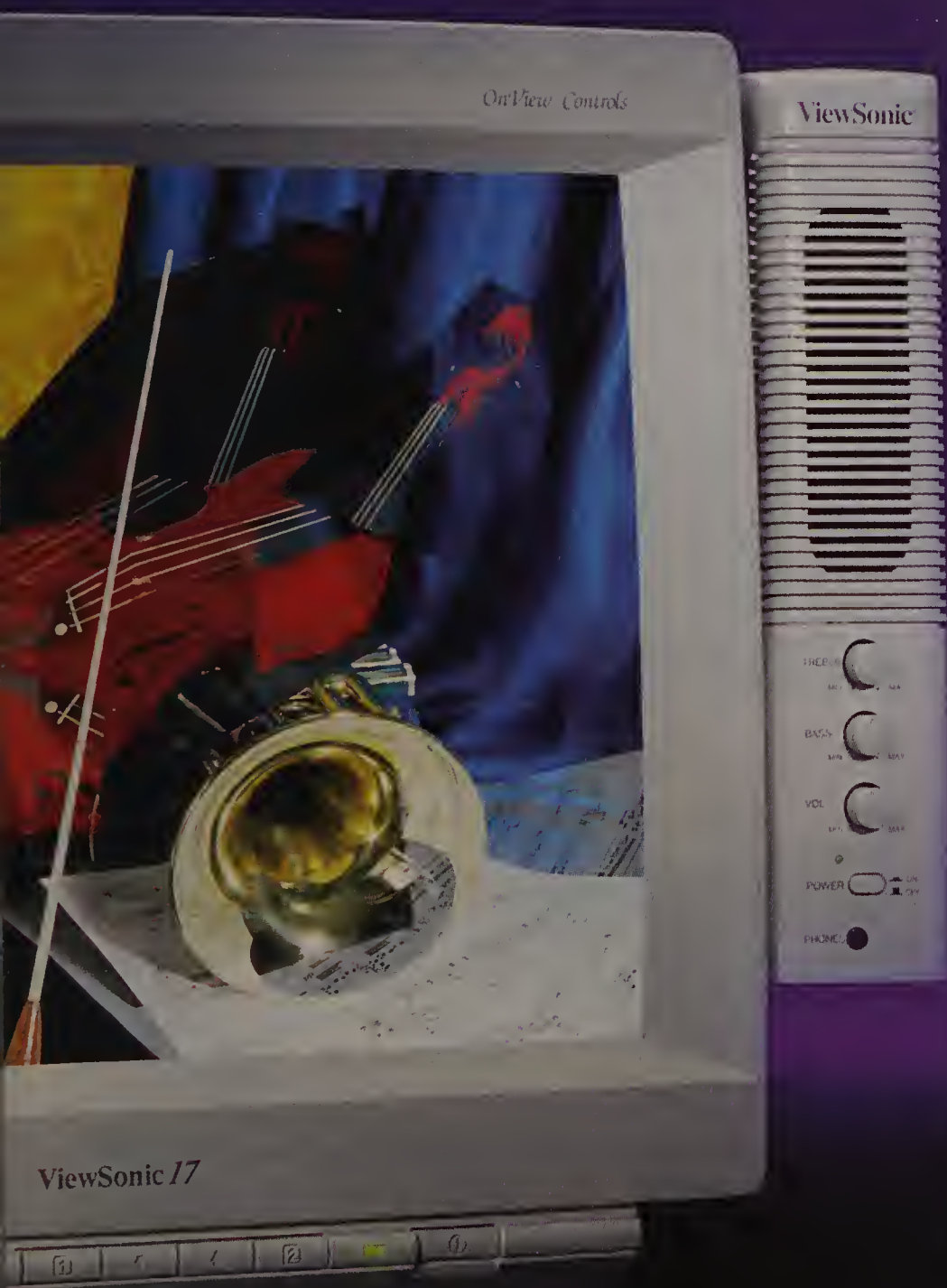
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At Work

THE LATEST TOOLS FOR BUSINESS COMPUTING

Power Mac Drives Database Action

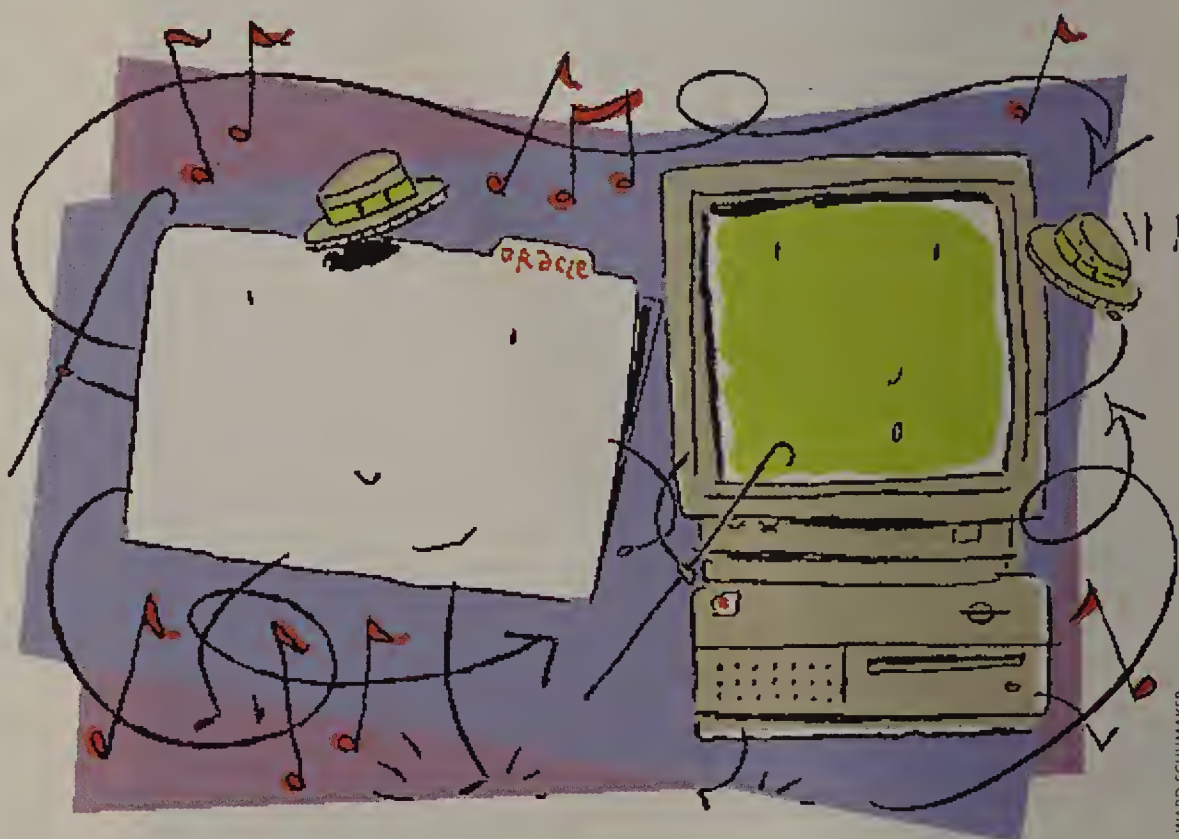


WILL THE POWER MAC GIVE Apple an entrée into big business? Only if the company can first convince database vendors that the Power Mac's high-power platform can support the data-management tools big businesses need. And prospects are beginning to look up: Oracle Corporation, the leading database vendor, is launching a new line of database-development and -deployment products for the Mac, including a full-featured SQL database server for the Power Mac. Meanwhile, EveryWare Development, a small company that sells Butler—which until Oracle ships will be the only SQL database engine for the Mac—is shipping its Power Mac-native Butler and expanding its product line with a series of Butler-based office-automation tools to tie large workgroups together.

Oracle: Mostly There With some significant exceptions, the Mac versions of Oracle's Workgroup/2000 products will be at parity with Workgroup/2000 products on other platforms.

The new product line includes Personal Oracle7, a database-development environment; application-development tools called PowerObjects, for the non-technical user; and Oracle7 Workgroup Server, which requires a Power Mac. However, the company has no plans for a Mac version of Oracle7 Enterprise Server, which runs organization-wide applications distributed across multiple servers, including OS/2, Windows NT, and Unix.

Personal Oracle7 should ship in the second quarter of 1995 for \$399; PowerObjects should ship in mid-1995 for \$399; and Oracle7 Workgroup Server should ship in mid-1995 (server and runtime pricing depend on number of users). Oracle is also developing a utility for converting XBase files into Oracle databases.



WARD SCHUMAKER

Applied Butler The first product in EveryWare's office-automation Enterprise series is Time Capture, which combines a group scheduler that helps plan tasks and meetings with tools for tracking work and gathering time-billing information. Because Time Capture's Butler engine is pure SQL, information gathered in Time Capture (or any other Enterprise-series product) can easily be accessed from other applications. For example, if you schedule a block of time to work on a client's project and later record the work completed, Time Capture can deliver that information to an accounting package for billing. Time Capture is shipping; price depends on number of users, starting at \$149 per user.

Scheduled for a first-quarter 1995 release is Enterprise Document Management, which provides access to documents and keeps track of who uses them. Documents can be categorized with user-

definable keywords and retrieved by keywords, author, dates, and other criteria. Document Management also provides document check-in and check-out and version tracking. Pricing is the same as Time Capture's.

Also scheduled for a first-quarter 1995 release is Enterprise Periscope, a tool kit for building point-and-click database front ends, often called executive information systems, that provide quick, graphical summaries of the underlying database. Periscope can access data from Butler, as well as from Oracle, DAL-compliant databases, and ODBC-compliant databases. Periscope's final pricing was not set at press time.

EveryWare is also developing a contact manager and a print-monitoring utility. Both are scheduled to ship later in 1995; pricing was not set at press time.

The Future of Databases Will other major players in the database market

move to the Mac, now that its performance is not an issue? That depends on how well the Power Mac penetrates the business world—which may depend in turn on how many Oracle clients decide to give the Power Mac a chance. Mean-

while, Oracle competitors CA/Ingres and Sybase are playing wait and see with the Power Mac, while IBM would not comment on its plans for DB2.

EveryWare Development, 905/819-1173; Oracle, 415/506-7000.—D.L.

The Bar-Code Technology Boom

THOSE BLACK-AND-WHITE-STRIPED bar-code labels you see everywhere—on retail packaging and rental cars, machine parts and medical X rays—are a basic requirement for tracking any kind of inventory these days, and vendors are at last laying a solid infrastructure for producing and processing bar codes with the Mac.

Videx, for example, is shipping several Mac bar-code products. BarCode Labeler II is a \$149 software package for creating and printing bar-code labels. It provides label-layout features, can merge data from a database, and can print numbers in sequence for such uses as serial numbering. It supports seven common bar-code symbologies, including UPC (A&E), the most common U.S. retail symbology. Videx also sells a bar-code reader called the OmniWand; a Mac version of Application Builder, the software for creating OmniWand applications, should ship in February for \$349. Application Builder is intended to enable non-technical users to produce bar-code applications quickly. It can parse and validate data collected by the OmniWand, issue error messages, and perform other essential point-of-sale and inventory-tracking tasks. The OmniWand starts at \$1235.

Bar Code Systems offers a couple of important links in the bar-code cradle-to-grave data-capture chain. It markets the TEC (Tokyo Equipment Company) B-472 and B-572 thermal-transfer printers, which can run on the Mac. The \$1995 B-472 prints 200-dpi bar codes at 10 inches per second; the \$3495 B-572



The OmniWand bar-code reader also has a keypad for entering data not captured in the bar code.

prints 300-dpi bar codes at 8 inches per second and includes a wide variety of fonts and bar-code symbologies. Bar Code Systems also manufactures the Xaminer 5500, a \$2295 hand-held unit that tests bar-code printer output for compliance with ANSI standards.

Bar Code Systems, 404/399-5921; Videx, 503/758-0521.—D.L.

Peachtree Blooms Again

THE COMPETITION IN SMALL-BUSINESS accounting software is heating up: BestWare recently shipped M.Y.O.B. 5.0 at \$139 list, and Intuit just launched a Mac version of QuickBooks for about \$120 street. Now, long-quiescent Peachtree Accounting for Macintosh (PAM) is reemerging in version 2.5 at \$99 street.

PAM 2.5 includes job costing, payroll, and inventory; the inventory feature handles assemblies, as well as noncommodity products, such as consulting time. PAM can switch between cash and accrual accounting; includes quick analyses of cash, receivables, and payables to give business owners a high-level view; has a floating palette with a guide that explains

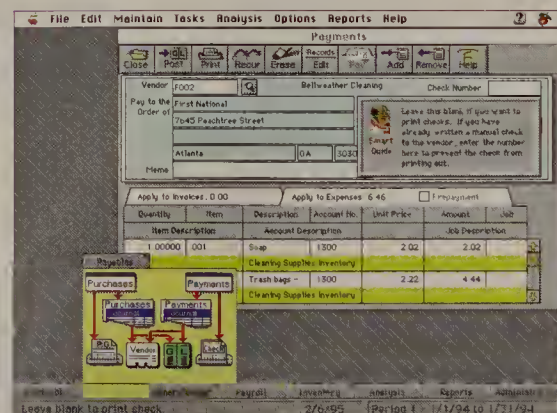
IN BRIEF

■ Multisite Point-of-Sale

Ensign Systems is expanding its POS/IM (Point-of-Sale/Inventory Management) product line with a central-office database that gathers information from satellite retail sites for use in redistributing inventory and consolidating accounts. The new module, which should ship in March, was unnamed and unpriced at press time. 801/546-1616.

■ Excel Budgeting, QA

Plug-ins Spreadware is taking advantage of Excel 5.0's Visual Basic for Applications to produce more-sophisticated Excel add-ons than were possible under Excel 4.0. Spreadware Budgeting, which is shipping for \$289, can break up the corporate-budget pie so that each department can develop its own budgets, then consolidate the slices; it also provides budget-analysis tools. In March, Spreadware will release Stats SPC (Statistical Process Control), a collection of specialized tools for evaluating manufacturing and other measurable processes. Stats SPC will list for about \$350. 619/772-1758.



Peachtree Accounting for Macintosh version 2.5, showing the flowchart window for navigating through the database.

each step of every transaction; and presents the database as a series of flowcharts so that users can easily grasp the database structure.

PAM 2.5 should ship in March. It is multiuser over AppleShare or file sharing; its price covers all users accessing one copy of the program (of course, performance will suffer as users stack up). Each module can have a different password.

BestWare, 201/586-2200; Intuit, 415/322-0573; Peachtree Software, 404/564-5700.—D.L.



The TEC B-series thermal-transfer devices are used for on-demand printing of bar-code labels.

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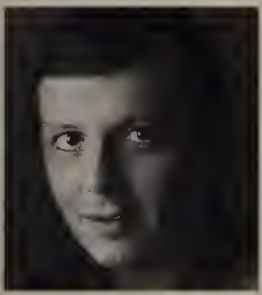
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BY JIM HEID

Working Smart

Conquering Font Overload

THE MAC'S SYSTEM FOLDER HOLDS MANY resources, but only one category helps you express yourself: fonts. Professional publishers have huge font libraries, and many of the rest of us aren't far behind. Many printers and programs come with font collections. Free and shareware fonts abound. Fonts are fun—you can never have too many ways to express yourself.

Until, that is, you fall victim to the many side effects of fontmania: launching programs takes longer; the Font menu sags past the bottom of your screen; and your System Folder bloats, becoming a ball and chain at backup time.

This month's column details a font-management strategy designed to avoid these problems. For tips on using PostScript printers, see "Using Printer Fonts." And for essential background on the various pieces of the font puzzle, see "A Field Guide to Fonts and Their Icons."

Font Management: Overview

If you have a moderate-size font library—ten or so fonts with the standard plain, italic, bold, and bold italic styles—you probably don't need to worry about managing your fonts. But as your font collection grows, it's inefficient to just chuck every font into the System Folder. Better to install only your everyday fonts that way, and organize other fonts into logical, related categories by how you use them: one set for the company newsletter, another for the technical manuals, perhaps another with flashy fonts for invitations and certificates.

The Mac doesn't provide such font-management luxuries, but you can get them by combining features it does provide with either Suitcase 2.1.4 (\$79; Symantec Corporation, 503/334-6054) or MasterJuggler 1.90 (\$69.95; Alsoft, 713/353-4090). I recommend MasterJuggler; it's easier to use and has a much more up-to-date manual.

Creating a streamlined font-filing system involves three phases: grouping

fonts into suitcase files; organizing suitcases and their related printer font files into folders; and using Suitcase or MasterJuggler to open and close suitcase files and create font sets as needed.

Phase 1: Packing Suitcases

The Mac used to include a utility, Font/DA Mover, that allowed you to create suitcase files and move fonts in and out of them. Font/DA Mover is still around, but it's no longer included with the Mac's system software. (It is included with Suitcase and some other products, and it's available on America Online.)



You can create and pack suitcase files in System 7's Finder without using Font/DA Mover. The secret is to start with an empty suitcase file, which you can create yourself. To avoid wiping out any fonts, use the Finder's Duplicate command to make a copy of a suitcase. Double-click on the copy to open it, choose Select All after it opens, and drag the fonts to the Trash. Close the suitcase file's window and rename it. From now on, each time you want to create a new suitcase file, just copy and modify your "master" empty suitcase. To prevent accidental modifi-

cation of your master, lock it using the Finder's Get Info command.

Everyone has his or her own suitcase-packing techniques, whether you're talking Samsonites or fonts. For the latter, what I do is pack all four styles of a given font family into a suitcase that I've named after the family.

When you're packing the fixed-sized fonts that the Mac uses for its screen displays, you have another decision to make: how many fixed sizes to include in the suitcase. The Mac needs only one fixed size to be able to use a PostScript font; it doesn't need any fixed sizes to use a TrueType font. Thus, you can save some disk space by not storing a lot of fixed-sized fonts.

But there's a catch: when you choose a font size for which no fixed size is available, the Mac must generate, or rasterize, the size on the fly. PostScript fonts use Adobe Type Manager (ATM) to do this; the Mac's system software does it for TrueType fonts. (ATM 3.8.1 \$39.95; Adobe Systems, 415/961-4400; often included free with Adobe products.) This rasterizing process takes a moment or two; the delay can be especially apparent on slower Macs. For this reason, you get the best scrolling and text-display performance if you retain the fixed-size fonts for the type sizes you use most often.

So how do you do the actual packing? Use the Finder. First quit any open programs or desk accessories and then open up the System Folder's Fonts folder (or the System file itself in System 7.0). Finally, drag each font into the empty font suitcase you created earlier. If the fonts you want to move are already stored within a suitcase file (as they can be in Systems 7.1

continues

and 7.5), you can drag the entire suitcase into the new suitcase, or open the suitcase file and drag only the font sizes you want to the new suitcase.

Phase 2: Filing the Fonts

You've created a suitcase file for each of your font families, and you've copied to each suitcase file that family's fixed-sized fonts plus any TrueType fonts. But organizing fonts into suitcases is one thing; deciding where to store the suitcase files, with the printer font files PostScript fonts require, is another.

One of the beauties of using Suitcase or MasterJuggler is that you aren't restricted to storing fonts in your System Folder. You can stash them in separate folders on your hard drive, on a removable-cartridge drive, or even on a network file server. The file server approach has important advantages for a large office: it makes it easy to standardize on a consistent set of fonts, and it eliminates the need to store PostScript outline fonts on each user's hard drive. If you store a typeface's outline fonts in the same folder with the typeface's suitcase file, the Mac's PostScript printer driver as well as Adobe Type Manager will still be able to find the outlines. Note, though, that accessing fonts over a LocalTalk network isn't exactly speedy; the file-server approach is most practical for Ethernet networks.

If you want more than one person to be able to open a given suitcase file, you need to tell MasterJuggler or Suitcase to open that file as shared.

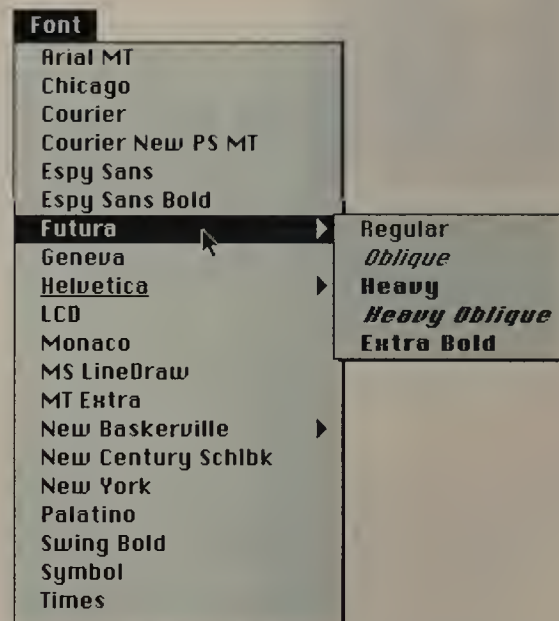
Phase 3: Managing Suitcases

Using MasterJuggler or Suitcase to access fonts is easy: just use either utility's Open button to open the suitcase files you need. Both utilities let you specify suitcases to open automatically at start-up.

But there are some flies in the font-management ointment, and they have to do with the way Mac programs access fonts. A program builds its Font menu when you start it up—if you open a suitcase after starting a program, the fonts you open won't show up in the program's Font menu. To access them, you have to quit the program and then relaunch it.

A potentially more serious problem surfaces when you close a font suitcase while a program is running. Mac programs aren't smart enough to know that a given font is no longer available—the font still shows up in their Font menus. If you choose the closed font's name, the program you're in could crash. System 7 doesn't let you install or remove fonts when programs or desk accessories are open, but MasterJuggler and Suitcase do. Fortunately, it's easy to avoid both problems: just remember to open the fonts you need before starting the program in which you'll use them, and to quit that program before closing those fonts' suitcases.

I've mentioned that a good font-management technique is to create font sets for the types of documents you work with. One way to do this is to create a suitcase file containing those fonts—for example, the Baskerville you use for the text of your monthly reports, and the Futura Bold you use for the headings. The problem with this approach is that you can end up with a lot of suitcase files that contain some of the same fonts. Both MasterJuggler and Suitcase let you define named sets of suitcase files—you can, for instance, create a font set named Report Fonts that automatically opens the Baskerville and Futura suitcase files, avoiding the disk waste that occurs when some fonts are stored in more than one suitcase. And it keeps your font library organized the way it should be: according to the fonts themselves.



Reunited We Stand Adobe Type Reunion cuts down on Font-menu clutter by grouping font styles under the font's family name.

Reunite that Font Menu

Using MasterJuggler or Suitcase reduces one kind of Font-menu clutter; Adobe Type Reunion addresses a different kind (ATR 1.0.3 \$65; Adobe Systems). The problem surfaces with PostScript fonts that include screen fonts for each style variation (italic, bold, bold italic, and so on). Having these style variants is wonderful because it gives you a screen display that's more faithful to the final output. But the downside is that each style variant shows up in your Font menu. Install a few such font families, and you can't help but suffer from sagging Font menus.

To address this mess, Adobe Type Reunion groups styles under the font's family name (see "Reunited We Stand"). Adobe Type Reunion is included with some Adobe programs, including the CD-ROM versions of Illustrator 5.5 and Photoshop 3.0.1. WYSIWYG Menus, part of Now Utilities (\$89.95; Now Soft-

continues

A Field Guide to Fonts and Their Icons

Several kinds of icons can appear in the Fonts folder; each kind represents a different piece of software used to render type on screen and in printers.

Fixed-Size Font File

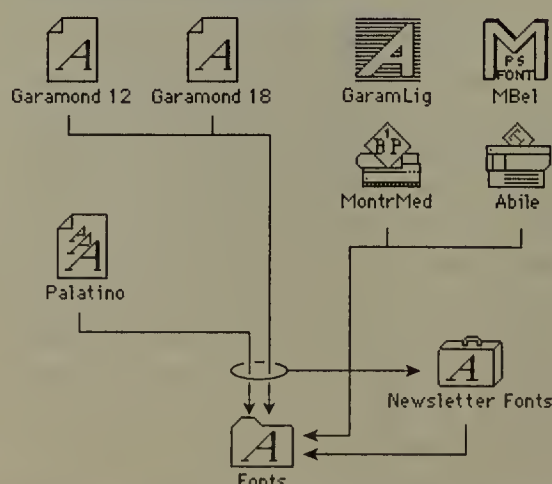
A dog-eared page with a single letter A indicates a bitmap of one font size. Fixed-size bitmaps help PostScript and TrueType render type on screen.

TrueType Outline Font

The triple-A icon indicates a TrueType font, which can generate type of any size. You need not install fixed-size bitmaps for TrueType fonts, but doing so improves rendering speed and the quality of fonts on screen.

Fonts Folder

Under Systems 7.1 and 7.5, all fonts and suitcases live in the Fonts folder inside the System Folder (unless you manage fonts with a third-party utility).



PostScript Font

Contains font outlines for PostScript printers. Also used by Adobe Type Manager for high-fidelity fonts on screen and on QuickDraw printers. Requires at least one fixed-size font of the same family. (Icons vary by vendor. Shown clockwise from upper left: Adobe, Monotype, Fluent Laser Fonts, and Graphite.)

Suitcase

A convenient way to organize fonts. Suitcases can contain TrueType fonts and any sizes and styles of fixed-size fonts (but not PostScript fonts).

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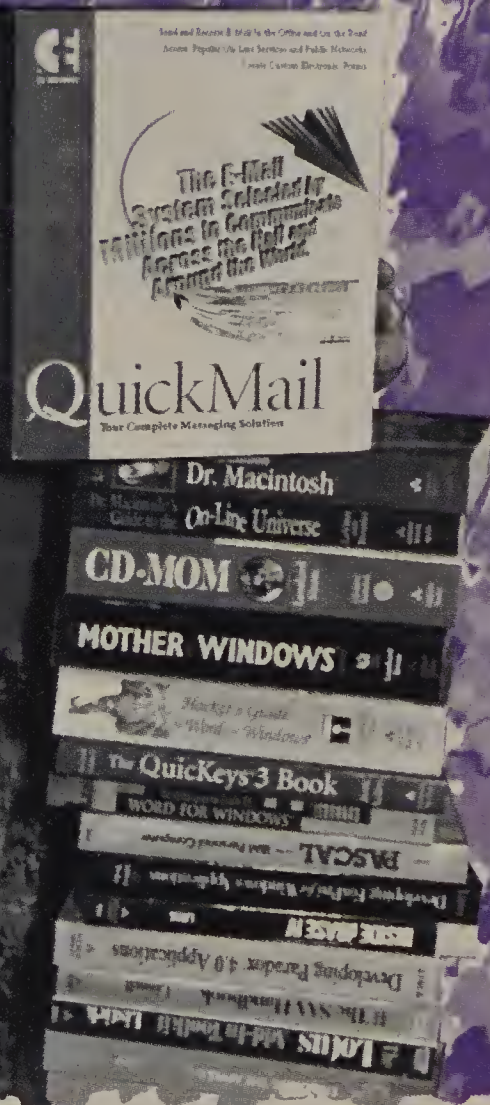
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USING PRINTER FONTS

The following are some tips for dealing with PostScript printer fonts.

- **Download often-used fonts manually.** If you frequently use downloadable fonts (ones not built into a printer), you can significantly boost printing times and cut network traffic by using a utility such as Apple's Printer Utility or LaserWriter Utility (both provided with Apple PostScript printers) to download often-used fonts at the beginning of the day. (I've included a shareware font downloader in the Macworld areas of AOL and eWorld.)

- **Connect a hard drive to your printer if it supports one.** Copy downloadable fonts to the printer's hard drive, and the printer can retrieve them almost instantly. A dedicated hard drive boosts the printer's overall performance, too.

- **Consider converting TrueType fonts to PostScript format.** If your printer doesn't contain the TrueType rasterizing software—many non-Apple PostScript printers do not—TrueType fonts will print more slowly than their PostScript counterparts. You can fix this by using Macromedia's Metamorphosis Professional 2.04 (\$149; 415/252-2000) to convert TrueType fonts into Type 1 fonts.

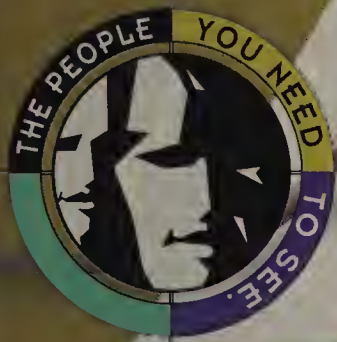
ware, 503/274-2800), can reunite font styles and also display font names in their actual typefaces (an option I don't like because it makes Font menus slower to appear).

Incidentally, while sniffing around on America Online, I found a file describing some interesting modifications you can make to Adobe Type Reunion using Apple's ResEdit utility. I've included this file in the software libraries in Macworld areas of AOL and eWorld. [m](#)

Next month: Connecting to DOS/Windows printers

Contributing editor JIM HEID's *Macworld Complete Mac Handbook Plus Interactive CD*, third edition, and *Macworld Ultimate Mac CD-ROM* (both from IDG Books Worldwide, 1994) each include over 100 PostScript and TrueType fonts with font utilities.

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SPECIAL KEYNOTE SPEAKER

Jim Buckley, President, Apple Computer

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BY LON POOLE

Quick Tips

Tips, Tricks, and Shortcuts

YOU CAN CHANGE THE BACKGROUND pattern of System 7.5 utility windows such as Find File, Calculator, and Scrapbook. Gary Stahara of Arvada, Colorado, suggests the following method: Open the Desktop Patterns control panel, and scroll to find a pattern you like. Press option to change the Set Desktop Pattern button to Set Utilities Pattern, and click that button. Whatever pattern you set will be used for all the utility windows.

You can add a new pattern by copying a computer-generated, scanned, clip-art, or Photo CD image and pasting it into Desktop Patterns. (The source program must copy the picture in a format that can be seen with the Show Clipboard command in the Finder's Edit menu.) For detailed instructions, see "How do I change the background pattern?" in System 7's Macintosh Guide, which is located in System 7.5's Guide menu (previously known as the Help menu). Similarly, you can copy the currently visible pattern from Desktop Patterns and paste it into a paint program for editing. If your graphics program works with System 7.5's drag-and-drop editing, you can drag a selected image from the graphics program to Desktop Patterns and vice versa.

Whence Espy

Q Two bitmap fonts, Espy Sans and Espy Bold, are available and usable in some of my applications. They are not listed in the Fonts folder, and the Find command cannot locate them. How is that possible, and how can I trash them?

*Samuel Zelman
Topeka, Kansas*

A Those fonts are inside a font suitcase named eWorld Fonts, which was placed in your Fonts folder when you installed eWorld. Keep the fonts if you still use eWorld. Otherwise you can drag

that font suitcase to the Trash. If you were a developer of software for the Newton, you would also find the Espy fonts inside a font suitcase named Newton Toolkit Fonts in your Fonts folder.

The Find command and System 7.5's Find File utility don't search suitcase files for individual font files. If the suitcase's name is not similar to the names of the fonts inside it, Find and Find File won't locate the font. To find hidden font files, open each suitcase and scan its contents.



Missing Speech Manager

Q I installed System 7.5 and now I can't find Speech Manager. Where is it? Speech recognition and text-to-speech don't work when I install them from my System 7.1 CD.

*Donald M. McCarter
Bethesda, Maryland*

A System 7.5 requires PlainTalk 1.3. It's one of many extras you get with the CD-ROM version of System 7.5

but not with the floppy disk version. You can request the five PlainTalk 1.3 installation disks from the Apple Assistance Center (800/767-2775), or you can get PlainTalk via eWorld (in the Apple Customer Center), AppleLink (in the Software Sampler folder), or one of Apple's Internet FTP servers, such as ftp.info.apple.com (in the Apple.Support.Area directory) or ftp.support.apple.com (in the pub directory). In all of these online sources, the folder path is Apple Software

Updates: Macintosh: System Software: PlainTalk 1.3. Earlier versions of PlainTalk are also available online. PlainTalk 1.2.1 is for Power Macs running System 7.1.2, and PlainTalk 1.0 is for 660AV and 840AV Macs with System 7.1.X.

Damage Control

Q When I turn on my Performa 450, I get an error message stating that Launcher could not be opened because an error of type -39 occurred. Why is this happening?

*Kevin L. McDonald
Merrillville, Indiana*

A Error -39 means the end of a file unexpectedly and is a sign of file damage. Try dragging Launcher Preferences from the Preferences folder to the Trash and restarting. If the problem persists, get a clean copy of Launcher from the backup disks you made when you got the Performa. Can't find your backup disks? Throw yourself on the mercy of the Apple Assistance Center (800/767-2775) and ask for Performa system software. *continues*

ware installation disks. Or upgrade to System 7.5, which contains a new version of the Launcher.

Launcher Additions

TIP To add an item to the Launcher control panel, you ordinarily have to make an alias of the item and drag the alias to the Launcher Items folder in the System Folder. You can use the Script Editor program that comes with the System 7.5 CD-ROM to create an AppleScript application that does most of the work for you. Follow these steps:

1. Open the Script Editor, and in the bottom panel of a new script window, type the script exactly as shown in "Launcher Genie." Where you see the continuation symbol (↵) type option-return. You can type anything in the description box at the top of the script window, or leave the description box empty.

2. Click the Check Syntax button to have Script Editor look for mistakes in your script. If it can't make sense of some part of your script, it describes the problem. Otherwise it changes the font from Courier to Geneva and makes command words bold, indicating the script was compiled without error.

3. Save the script, choosing Application from the Kind pop-up menu in the Save dialog box. This causes Script Editor to create an application for the script.

There are two ways you can use this AppleScript application to add items to the Launcher. One is to drop one or more documents, folders, or applications on the icon of your AppleScript application. The other is to double-click the AppleScript application, bringing up a standard Open dialog box in which you choose an application you want to add to the Launcher.

Either way, use actual applications or other items, not aliases, because the script creates aliases for you.

*Clint Beilman
Casselberry, Florida*

This script won't be very useful if you have grouped Launcher items by placing them in specially named subfolders of the Launcher Items folder (as described in the Macintosh Guide topic "How do I group items in the Launcher?"). That's because the script always places items in the Launcher Items folder itself, not in specially named subfolders. You can work around this problem by making a special version of the script for each subfolder. For example, inserting the line

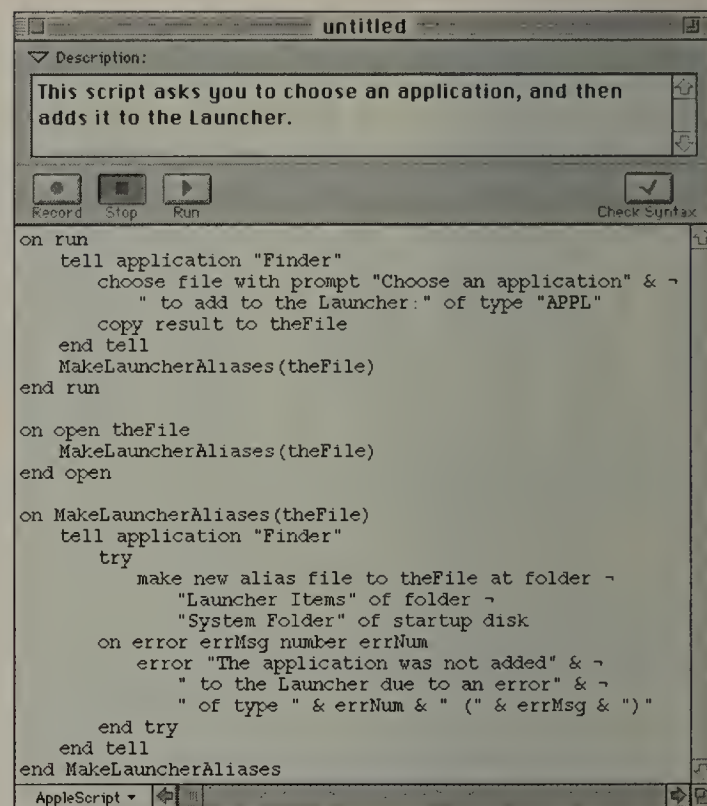
"•Priority Documents" of folder ↵

after the line beginning "make new alias file" would modify the script to add items to the •Priority Documents subfolder. For more information on AppleScript, get *The Complete AppleScript Handbook*, second edition, by Danny Goodman (Random House, 1995), or *The Tao of AppleScript*, second edition, by Derrick Schneider (Hayden Books, 1994).

Multiple scripts are not going to be as efficient as the scriptless trick that is illustrated in "Launcher Access."—L.P.

Forget Some Recent Items

TIP I love System 7.5's Apple Menu Options control panel, including its ability to list recently used documents in the Recent Documents submenu of the Apple menu for quick reopening. But I don't need it to track recently used applications or servers because I use Scott Johnson's PowerBar shareware [the pow-



Launcher Genie This AppleScript script makes aliases of applications directly within the Launcher Items folder, so you can launch the applications from the Launcher control panel. You can either drag applications to the script's icon or you can open the script's icon and choose an application from a standard Open dialog box.

er user's Launcher] to launch applications and am not connected to any servers. I discovered that if I set the number of applications and the number of servers both to zero in the Apple Menu Options control panel, the Recent Applications and Recent Servers items disappear.

*Victor H. Gajewski
Manteca, California*

Stopping a Start-up Movie

TIP I made a long QuickTime movie from some CD-ROM clips, named the movie Startup Movie, and placed it in the System Folder so it plays

FLARED TYPE

Here is a simple step-by-step procedure for making flared type in Adobe Illustrator 5.0 or 5.5, contributed by Greg Hervey of Austin, Texas.

1. Begin by creating outlines of the word to be manipulated.

ROTTWEILER

2. Scale the outlines to about 50 percent vertically.

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3. Using the Free Distort filter, pull one corner of the word down slightly.

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4. Apply the filter several more times to give the line of letters a curved look.

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5. To make the type arch symmetrically, distort half the word as described above, and then do the opposite distortion on the other half of the word.

ROTTWEILER

when I start up my Mac. When I'm in a hurry and don't want to wait for the whole start-up movie to finish, I press the spacebar to stop it.

*S. Fawad Sayeed
Elmhurst, Illinois*

As with any copyrighted material, movie clips from a CD should not be copied or altered without the copyright holder's permission.—L.P.

Extra Drive

TIP If you want to fix or optimize your only hard drive with a utility program that can't be run from the drive it's working on (and won't fit on a floppy), use a RAM disk as follows:

1. Create a floppy start-up disk with the bare minimum System Folder. You can do this by copying the System Folder from the Disk Utilities floppy that came with your Mac. If your Mac came with a CD-ROM and no floppies, use the Disk Utilities disk image on the CD to make a Disk Utilities floppy.

2. Place the Memory control panel in the floppy's System Folder.

3. Use the Memory control panel to create a RAM disk just the size of the application you need to use. After you restart the computer, the RAM disk will use part of the computer's RAM as if it were a disk drive.

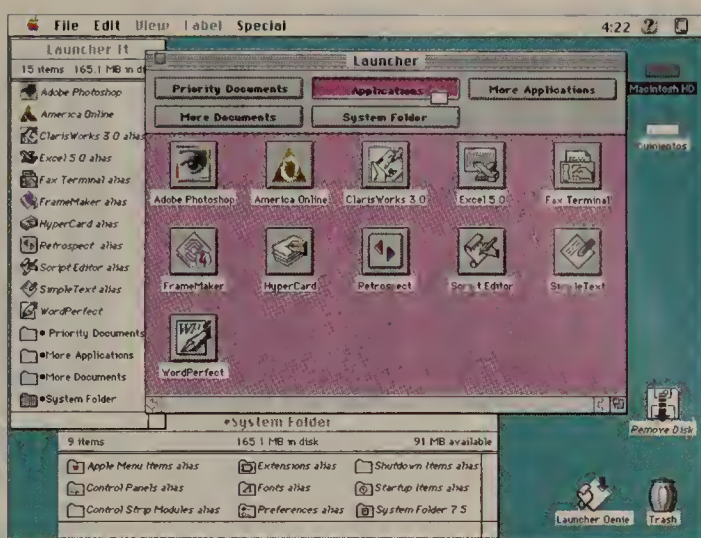
4. Restart, copy the utility program you need from the hard drive to the RAM disk, and launch the program from the RAM disk.

There you have it. The application runs from the RAM disk, and the floppy is your start-up disk. (Of course if you have lots of RAM you don't need the floppy. Skip steps 1 and 2. In step 3, create a RAM disk large enough for a System Folder and the application you need, and copy them both to the RAM disk in step 4. Before launching the program, use the Startup Disk control panel to make the RAM disk the start-up disk and restart once more.) The RAM Disk feature is not available on all Mac models and with all versions of the system software. If it is not available on your computer, your Memory control panel will not have settings for it and you can't use this tip.

*Marcos Huerta
Lake Jackson, Texas*

Outside Signs

TIP Here's a handy little trick I used recently to make a small sign to post outdoors. Design a sign smaller than



Launcher Access System 7.5's Launcher control panel is more useful if you group items in it by placing them in specially named folders inside the Launcher Items folder. To simplify opening the folder that defines a group so you can add items to it or remove items from it, use the trick suggested by Brian Shapiro of Farmington Hills, Michigan: option-click the group's button. The cursor looks like a folder when it is over the Launcher's buttons with the option key pressed. ⌘-option-clicking the gray area between buttons brings up a Launcher credits screen (not shown).

8½ by 11 inches in a drawing program. Before printing on a sheet of overhead film, click the Options button in the Page Setup dialog box and flip the image horizontally to make the sign print backwards. After printing, spray the side that has toner on it with white or light-colored spray paint. Flip it over, cut it out, and affix it with thumbtacks. Now you have a small sign that's pretty much weather-proof. Using this technique you could give the old No Soliciting sign some new character by creating one with a new typeface. You could even spray-glue a couple of catchy Garage Sale signs onto Gator-board (heavy mounting board) so they'd hold up in the rain.

*Brian White
Houston, Texas*

Sound Follow-up

The 660AV, 840AV, and Power Macs can record stereo, as I mentioned in February's *Quick Tips*. So can the PowerBook 500-series Macs, notes Hector Levesque of Toronto, Ontario. **m**

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LON POOLE answers readers' questions and selects reader-submitted tips for this monthly column. His latest book is *Macworld System 7.5 Bible*, third edition (IDG Books Worldwide, 1994).

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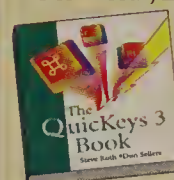


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THE LATEST IN CONNECTIVITY AND COMMUNICATIONS

Apple Outlines PowerTalk Plans

IN 1993 WHEN APPLE INTRODUCED THE first components of Apple Open Collaboration Environment (AOCE)—System 7 Pro (with PowerTalk system extensions) and the PowerShare Collaboration Server (\$999)—they were greeted, as one third-party developer puts it, with a giant yawn.

Now that PowerTalk version 1.1 ships with System 7.5, its installed base and consequently its development priority at Apple have significantly increased. As a result, Apple has outlined an ambitious agenda to eliminate weaknesses, such as an anemic mail client and high memory requirements, and to add functionality, such as built-in Internet support. Just as Apple used AppleShare and personal file sharing to integrate file services into its operating system, the company has a long-term goal to use PowerShare and PowerTalk to integrate mail and directory services into the operating system.

The first step is to publish APIs (application programming interfaces) for PowerTalk, which Apple intends to provide this spring. The PowerTalk Mailbox API, which will support Apple-events scripting, will enable other developers to produce alternate PowerTalk clients as well as rules-based software and message-conversion utilities (for example, text-to-speech software). In fact, as Apple includes more E-mail services in the operating system, the opportunities for third-party mail vendors will be in these types of value-added products, as well as in mail-enabled applications.

In late summer Apple plans to ship an incremental upgrade of PowerShare, migration tools for Microsoft Mail for AppleTalk users, and a PowerShare Windows client. PowerShare 1.X will have improved support for SMTP and UUCP. Microsoft Mail migration tools will en-



able users to import Mail directories and mail to PowerShare. (Microsoft no longer sells a Macintosh server for Mail.) The Windows client will let Windows applications that comply with Microsoft's MAPI (Messaging API) access PowerShare mail and directories.

Apple plans to release major upgrades of PowerShare and PowerTalk along with the shipment of the next-generation system software release, code-named Copland, scheduled for mid-1996 (see "Copland: Rebuilding the Mac OS" in *News*, April 1995). However, it's possible that Apple might release some of the planned improvements as they become available rather than wait for Copland.

PowerShare 2.0 will include an enhanced administration program, better system monitoring, live backup, server-to-server dial-up, and built-in gateways to

SMTP, X.400, and NetWare. Apple plans to eventually use one set of administration tools and one directory structure for both PowerShare and AppleShare.

The next major release of PowerTalk will include gateways to NetWare, including MHS and NetWare Directory Services; Unix, including POP, MIME, and SMTP; and public services, including the Internet, fax systems, pagers, and eWorld. (For more about Internet connectivity and operating systems, see "Internet in the OS," in *News*, this issue.)

PowerTalk for Copland will take advantage of Copland's file structure and the native AppleTalk provided by Open Transport to achieve performance gains. A new memory-management scheme will allow users to load PowerTalk as modules. Apple Computer, 408/966-1010.

—E.D.

StarNine Fills the E-Mail Gap

THIS SPRING, STARNINE TECHNOLOGIES plans to ship the final pieces necessary to turn a Macintosh into a full-fledged Internet information server. StarNine's EMail-On-Demand (eMOD), modeled on Internet mail processors such

Ethernet Hubs for Less

ALTHOUGH THE BUZZ IN NETWORKING circles favors switches right now, there's still a place for hubs in workgroups that don't require dedicated bandwidth—and hub makers are now competing aggressively for that niche.

Asanté Technologies has revamped its unmanaged Ethernet hubs to make them smaller and less expensive—as low as \$21 per port on the street—and easier to locate on the desktop or on the wall, in the wiring closet or in a cubicle. The three 10T Hub models (\$249 to \$749) have 8, 10, or 24 ports; they all support RJ-45, AUI, and BNC connectors.

Dayna Communications has also shrunk its DaynaStar \$189 MiniHub-5 and \$239 MiniHub-8 hubs, adding diagnostic front-panel lights.

Farallon Computing has reduced prices for its Ether10-T Starlet line of three 10BaseT hubs, which have street prices from about \$140 (with 4 ports) to \$490 (with 12 ports).

Asanté Technologies, 408/435-8388; Dayna Communications, 801/269-7200; Farallon Computing, 510/814-5100.

—NANCY E. DUNN



The DaynaStar MiniHub-5 (top) takes up little more space than a stack of index cards, and Asanté's 10T Hub/24 about twice that amount.

as Listserv, lets a Mac act as a central repository for mailing lists and automated information systems.

eMOD supports both simple mailing-list operations (including automated subscription) and more-powerful functions. Using rules, eMOD interprets incoming E-mail and can then take some action.

eMOD connects to QuickMail, Microsoft Mail, or SMTP E-mail systems, or it can receive E-mail directly from the Internet. Pricing was not set at press time, but the company expects eMOD to cost less than \$1000. StarNine Technologies, 510/649-4949.

—JOEL M. SNYDER

ATM Alternative

TWO SUPPLIERS HAVE JOINED FORCES to offer Asynchronous Transfer Mode (ATM) capabilities to the desktop at rock-bottom prices. Based on technology from Tut Systems and hardware from UB Networks, the new solution runs ATM at up to 155 Mbps over the Category 3 unshielded twisted-pair wiring commonly used for Ethernet networks. UB Networks' products using Tut's technology slated to appear this spring include PCI-bus ATM adapter cards and a new version of its GeoSwitch ATM switch, which will be priced similarly to the fiber version at \$995 per port.

Tut's technology provides a way to migrate networks to higher speeds without the expense of new wiring but doesn't adhere to today's ATM standards and can transmit signals for only 200 feet. Tut Systems, 510/682-6510; UB Networks, 408/496-0111.—MARTHA STRIZICH

Fast Ethernet Gets Real

TWO COMPANIES ARE MAKING FAST Ethernet a network reality by shipping 100-Mbps switching hubs and related products.

Grand Junction is shipping a line of hubs, switches, and repeaters based on the nearly final 100BaseT standard. The company's FastSwitch family of workgroup switches support 25 users with 10-Mbps links (\$6250 to \$9350), with from one to five 100-Mbps links. Two models come with two expansion slots for plug-and-play modules (\$495 to \$2495) for dif-

IN BRIEF

🔴 **NetWare Delayed** If you've been holding your breath waiting for the ultimate Macintosh version of Novell's NetWare, it's time to exhale. Apple Computer and Novell have once again pushed back the expected ship date of their joint development of NetWare for Power Mac. Now slated for fall 1995, the eventual result will be a native Power Mac version of Novell's popular network operating system (for more about NetWare, see *Networks* news, February 1995). Apple, 408/862-3385.

■ **SNaps Update** Wall Data, which acquired Apple's SNaps line, is adding APPC-based file transfer to its SNaps 5250 Gateway client (\$125). With APPC tools, the client opens a dedicated session on the AS/400 for file transfers. Its SNaps Gateway server software now provides shared-folder services to Macintosh users via SNaps Folders 400 (\$900), which creates AppleShare-like volumes for files. 206/814-9255.

ferent media. The first modules support 100BaseT unshielded twisted-pair and 100BaseT fiber connections. The company expects to ship a module for FDDI in the third quarter of 1995 and an ATM version in 1996.

Grand Junction's full-duplex option supports up to 200-Mbps throughput.

Network Resources Corporation's Ethernet switching hub, the MultiGate Switch, can reallocate bandwidth while it's running. The \$7995 switch delivers 10 Mbps to 12 ports, plus a 100-Mbps connection to a backbone or a server. The switch runs two 33MHz 68040 processors, with 1.2GB of shared memory. The MultiGate Switch accommodates any mix of 10BaseT, 10Base2, and 10BaseF slide-in modules (\$195 to \$395). It also supports FDDI, Fast Ethernet (both 100BaseT and 100VG-AnyLAN), and ATM. Management options include SNMP software for the Mac.

To take advantage of the 100-Mbps connections, Macs need a Fast Ethernet card, such as those described in *Networks* news, *Macworld*, April 1995.

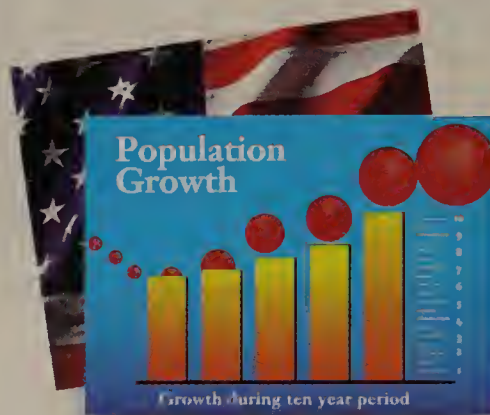
Grand Junction, 510/252-0726; Network Resources, 408/383-9300.

—NANCY E. DUNN

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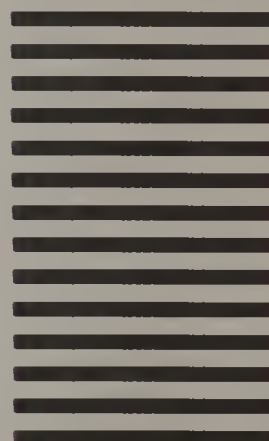
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BY CARY LU

PowerBook Notes

The Multimedia PowerBook

A POWERBOOK CANNOT MATCH THE multimedia capabilities of a desktop Mac. PowerBooks don't have the built-in hardware or expansion features—particularly video input—that make multimedia easy. The PowerBooks 140, 145, 145B, and 170 can handle sound but not pictures because they lack gray-scale displays. Neither the PowerBook 100 nor the 150 can record sound effectively. And none of these models can output video. However, most PowerBooks can perform key multimedia functions.

Showing Pictures

The 160, 165c, 180/180c, the Duos, and the 500 series can display pictures readily; 16-bit gray scale does a decent enough job for pictures, although the color PowerBooks certainly do better. For group viewing, an active matrix screen helps; an external color monitor does best. All PowerBooks with a video port will drive a 16-/17-inch monitor with 256 colors (832 by 624 pixels); the 500 series can also support 1024 by 768 pixels at 16 colors on a multisynchronous VGA monitor. (Hold down the option key when clicking on display options.) Only a Duo—through a dock—supports external monitors with more than 256 colors.

A PowerBook with a video-output port can drive virtually all projection panels designed for computers; in some cases you'll need a VGA adapter, about \$10. A Mac video-to-TV scan converter can put Mac images on a TV screen. In *The Desktop Critic*, *Macworld*, January 1995, David Pogue reviewed seven models and liked the \$159 MediNet Encoder (P2 Systems, 206/525-2081) and the \$229.99 L-TV Portable (Focus Enhancements, 617/938-8088). Two additional scan converters are worth noting. The moderately expensive \$429 Presenter 3 from Consumer Technology Northwest (503/643-1662) produces an excellent image. High-quality TV monitors with a Y/C (S-Video) input can display 12-point fonts legibly; monitors with a standard composite input

(RCA-style plug) show considerably more color noise but will suffice for typical graphics. The \$799.95 TelevEyes/Pro from Digital Vision (617/329-5400) can put an 800-by-600-pixel image on a TV (using the Super VGA mode of a PowerBook that has video output), giving you more working space, although small text isn't legible. The TelevEyes/Pro has gen-



locking, so its output can be combined with other images for video production.

Capturing Pictures

When it comes to capturing pictures, you have many choices, but the cheapest is via a fax machine. You'll need two phone lines; fax the image to your modem. You can avoid the phone call with the \$49.95 FaxScanner from SVA Software (305/446-9905), a small interface box powered by a 9-volt battery that simulates a phone-line connection. Fax machines don't produce high-quality scans, and many cannot handle grays; those that do produce grays by dithering—scattering black pixels to simulate grays.

Two companies make small portable scanners that are light enough to take on the road; both require AC power. The

\$399 Visioneer PaperPort (415/812-6400) connects to the serial port. Its bundled software emphasizes text-document management more than graphics and works very well for capturing pages and faxing; it's a pity that the mechanism is a simple 200-dpi manual-feed fax scanner. Like a fax machine, it simulates grays by dithering. The somewhat larger and far more capable \$499 ScanPartner Jr. from Fujitsu Computer Products (408/432-6333) captures 256 grays at 300 dpi and includes a ten-page sheet feeder, but its conventional driver software lacks the easy functionality of the PaperPort.

If you want to take a picture rather than scan a page, then the QuickCam from Connectix Corporation (415/571-5100) is the easiest and least expensive way. Typically selling for about \$100, the tennis-ball-size QuickCam has a fixed-focus wide-angle lens (65-degree angle of view, comparable to a 35mm lens on a 35mm camera) producing 320-by-240-pixel still images with 16 grays. The QuickCam connects to and gets its power from the serial port of any PowerBook (except the 100). Some 500-series PowerBooks need a \$9.95 patch cord that takes the power from the ADB port instead. The serial-port tether means you won't have the picture-taking freedom of a camera. The QuickCam cannot digitize a video signal, but it can take somewhat stilted QuickTime movies in the small 160-by-120-pixel size. Brightness is the only control you get. The results won't win any photography awards, but the QuickCam is adequate for casual use. Connectix should have a color version later this year (for more on the QuickCam, see *Reviews*, *Macworld*, March 1995).

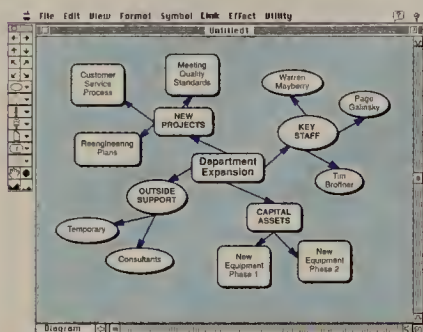
For larger, higher-quality picture taking, you'll have to spend much more on either a digital still camera or a video digitizer, which converts a standard television signal into digital form.

Digital Vision sells the \$599.95 ComputerEyes/RT, a video digitizer that

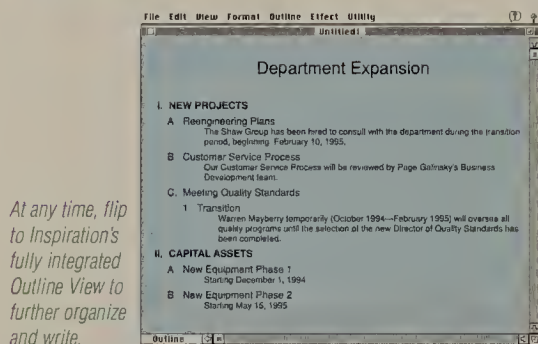
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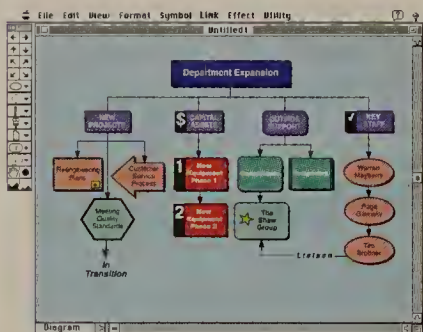
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NETWORKS: POWERBOOK NOTES

connects to any PowerBook through the SCSI port and can capture full-screen images in 24-bit color; its frame grabber can extract stills from moving video images. The RT also produces color QuickTime movies—at up to 12 frames per second at 160 by 120 pixels on a 500-series PowerBook, about 6 frames per second at the larger 320-by-240-pixel size. Although the RT can display a live video image, its slow frame rate makes it unsuitable for use as a television monitor. The ComputerEyes/RT requires AC power.

Digital Cameras

Digital cameras work without a computer, storing images in RAM, on a built-in disk drive, or on PCMCIA cards. Some cameras, such as Canon's discontinued Xapshot, output an analog video signal, requiring a video digitizer. The more interesting cameras send digital images directly to a serial or SCSI port.

The \$699 Apple QuickTake 100, a simple point-and-shoot camera with a fixed-focus lens and built-in flash, connects to the serial port and can store 8 images at 640 by 480 pixels in 24-bit color or 32 images at 320 by 240 pixels. Its picture quality is fair; color noise mars fine vertical detail.

Dycam (818/407-3960) also makes point-and-shoot digital cameras, but offers many options. The Dycam 3 takes 496-by-365-pixel images with 256 grays for \$695. The Dycam 4 camera has the same pixel count but with 24-bit color for \$795; it stores 8 images at the highest quality. The options include versions with greater storage and close-up, wide-angle, and telephoto accessory lenses. On special order, Dycam will provide a focusing lens or a camera body that takes C-mount lenses, the kind originally developed for 16mm movie cameras. This last option is not yet available for the color cameras.

For higher-quality digital color images, the costs climb quickly (see *Graphics news*, *Macworld*, February 1995).

Sound Input

Most PowerBooks include both a microphone and an audio-input port. The 100-series models and Duos with a sound port in a dock take a mike-level signal; use the Apple Omni-Directional Microphone (M1481LL/A, \$20). The 500-series models take a line-level signal. Microphone preamps or mixers can boost mike signals to line level, but they cost several hundred dollars. Apple's monaural PlainTalk Microphone (M9060Z/A, \$30) includes a preamp, but it requires 5-volt power. You'll have to build a 5V supply or make an adapter cable to get 5V from the ADB port; I suggest removing the unusual plug

on the PlainTalk mike and installing your own connectors. Perhaps someone will make an adapter cable as a commercial product someday.

The simplest good program for sound recording and playback is MicMac version 2.2, \$89 from Nirvana Research (408/459-9663). It can handle long recordings, provided you have the hard disk space. This works out to 5.3MB a minute for the highest quality 16-bit monaural recording—available only on the 500-series PowerBooks. For other PowerBooks, the highest quality 8-bit recording takes 1.4MB a second. For all PowerBooks, the lowest-quality recording takes 225K per minute. MicMac can record and play back in the background while you do other work with your PowerBook. MicMac has minimal editing features—it can only trim the beginning and end of a sound recording. For editing you need a program such as SoundEdit 16 from Macromedia (415/252-2000), at \$379 rather expensive for casual editing. With SoundEdit 16, you can record in stereo on the 500-series PowerBooks (call Macromedia for instructions).

For sound playback, the tiny speakers built into PowerBooks can suffice, but for better sound, you'll need a powered speaker. If you plan to listen to sound from a variety of CD-ROMs, get a powered speaker with two mixed inputs—one for the sound from the PowerBook, the other for CD-audio sound directly from the CD-ROM. The AppleDesign speakers (both the original and model II) are among the few with input mixing. Otherwise, you can plug the speakers into the CD-ROM drive and listen to the computer-generated sounds with the PowerBook's built-in speaker. There is no way to play CD audio directly through a 500-series PowerBook's stereo speakers. You can play CD audio in mono through a 100-series (except the 100 and 150) PowerBook's speaker with MicMac's play-through feature. (For more information on sound recordings, including audio connectors and attenuators, see *PowerBook Notes*, March 1994.)

When you play sound, install Control Strip (included in most recent PowerBooks and with System 7.5) for its quick-access speaker-volume control; you'll need to turn up the volume for sound you want to hear (such as your recordings) and down for sounds you don't want to hear (such as those annoying modem connection squeals). **m**

CARY LU is a *Macworld* contributing editor who covers mobile- and remote-computing issues in this monthly column. You can reach him at carylul@eworld.com.



Mega 'Zines

Electronic Mac mags make modems meaningful

THE POWER OF THE PRESS, GOES the saying, belongs to those who have one.

Not anymore. Thanks to a little gadget called a modem—and a big gadget called the Internet—anyone can be a publisher. Type up a text file, name it Milt's Mac-O-Rama, cork the bottle, and toss it out into the electronic sea of BBS systems and online services.

You've just started your own newsletter. Actually, to be trendy about it, you've just started your own *E-zine*, or just *'zine*.

There are dozens of these homebrewed rags on the cyber newsstand, as a quick search of your favorite service's libraries will attest. Many electronic periodicals fizzle out after a few issues; apparently some publishers start their E-zines with more E-nthusiasm than D-iscipline.

A few, though, manage to stay in business. Well, OK, *business* is a generous term; most of these 'zines are free. Heaven knows why people, without hope of a single cent of repayment, devote themselves to writing, formatting, and distributing these time-draining, social-life-sapping labors. But thank heaven they do. As you'll see in this roundup of E-newsletters about the Mac, several of them are surprisingly worthwhile reading.

Oh, P.S.—no letters asking “What if I don't have a modem?,” please. A true E-zine isn't available in printed form; its postage-free, instantaneous distribution (and consequent environmental savings) is the whole point. All of the 'zines described below are available from online services as well as the usual Internet sites. I've put a sample issue of each in the Mac-world areas of America Online and eWorld. (And anyway, get a modem; they're cheap these days.)

Information Alley

It must be tough writing manuals for Apple. I mean, you've got to write in that neutral, controlled, corporate tone that makes Apple look good and Macs look easy. You're never allowed to admit problems, hash out workarounds, or reveal secret features.

But thanks to the E-zine revolution, the backstage gurus in Cupertino have finally been unmuzzled. Twice a month they write, illustrate, and distribute a startling 20-page memo to the Macintosh world called Information Alley. Startling, because in no other forum is Apple so upfront about problems and undocumented features. It's also the only announcement the public gets of Apple's absolutely essential software updates and fixes.

Recent issues have revealed what causes Type 1, 2, and 3 errors; how to use the Newton's infrared beam feature; what causes freezes in Microsoft products under System 7.5; how to share printers between QuickDraw GX and non-GX Macs; how aliases work; where to find the secret Finder “about box”; what GPI is; and so on.



As you can tell from that list, Information Alley contains gems for people of all skill levels; right after an article on complex TCP/IP commands, you find a story called “The Blinking Question Mark.” There's no advertising, no editorial slant (except to be truly helpful), and no reason for everybody not to start looking up this Alley. (Free; published biweekly by Apple Computer; available in Common Ground double-clickable format or as .pdf files, which require Acrobat Reader.)

The Low-End User

Is it just my imagination, or do most novice-oriented Mac magazines—from *Macazine* to *MacComputing*—seem to bite the dust?

As it was explained to me, low-end magazines have a tough time attracting advertisers—and thus surviving. Ah, but in the world of electronic 'zine publishing, who needs ads? That's why an E-zine called The Low-End User (TLEU) is a timely, sane idea.

Ironically, The Low-End User newsletter is probably too techy for low-end users. It covers topics like the SuperCard authoring environment, compression software, and Usenet encoders.

But the bigger problem is content. The news sections seem to be paraphrased, uncredited, from magazines like this one. And some of the reviews are amazingly irresponsible. “I went over to my friend's house. He had [StuffIt] SpaceSaver. The main ‘splash’ picture in the control panel was in black-and-white and looked really jaggy. That in itself turned me off and caused me to prefer the more colorful AutoDoubler.” Er . . . this is a joke, right?

TLEU is clearly put together by well-meaning, hardworking Macintosh users, and its personal, “this-is-what-I-think” tone is welcome. But it's pretty much what you'd expect of a homemade newsletter in the nineties: filled with factual, spelling,

and grammatical errors, with reporting and reviews meant to be taken with a StyleWriter-size grain of salt. (Free; published monthly by Optifex Phoenix; in DocMaker double-clickable format.)

MacSense

If most other 'zines are the *Village Voice*—text-heavy, opinionated, printed on newsprint—then MacSense is *Life* magazine. It's glossy, gorgeous, richly illustrated. This Canadian export has photos, origi-

continues

nal artwork, consistent font use—it's actually designed.

There's more to a good read than graphic design, though; fortunately, MacSense's writing, editing, and reporting are top-notch too. I read, for the first time anywhere, what life is like with an Apple TV/Video Card installed in a Quadra 630. The MacSense editors' specialty is sensible discussion of Apple's direction. Example: regarding Apple's recent design decisions (the metal IIx case, the nonslurping floppy drives, boxy monitor designs)—is the cost savings worth the damage they do to the Mac's reputation for design excellence?

The reviews of popular-interest items like new Mac models, games, and utilities are, one and all, balanced and well researched. It just shows ya—put some smart people together with smart technology, and you've got a publication that's got to be 'zine to be believed. (Free; published monthly; edited and created by Christopher McVeigh; in DocMaker double-clickable format.)

DT&G

It stands for Design, Typography & Graphics, but Delicious Tricks by a Guru would do nicely, too. DT&G is a one-man tour de force of advice, instruction, and how-to's pertaining to all things graphic: fonts, PostScript, layout, formats, type, Photoshop, QuarkXPress, PageMaker, printers, printing companies, inks, editing, special papers, and on and on.

The tone is unique among E-zines: a first-person, instructive voice ("Can you tighten the top border of a photo closer to the person's head? I'll bet you can")—the voice of a tutor to his student. And little wonder: the sole author, editor, and publisher is veteran designer Fred Showker, who developed DT&G as a means of answering follow-up questions from his desktop publishing seminars.

Each issue, in fact, is a seminar unto itself; punctuated by crisp line-art and diagrams, the articles walk you through designing your own business cards, or creating a year-end client mailing, or writing a press release. There are other E-zines; there are even other E-zines about design and art. But none approach the usefulness of this one (especially not for free). (Free; monthly; in DocMaker double-clickable format. Six issues of a

disk edition, featuring clip art, diagrams, and the like, is available for \$99 if you fax in a cover sheet from The OnLine Edition of DT&Gmac.)

TidBits

As electronic Mac 'zines go, TidBits is the granddaddy of 'em all. Creators Adam and Tonya Engst report that their 300th issue will soon be flung into cyberspace.

How can one describe TidBits? It's weekly; it's all text; it's professional. There's a heavy slant toward technical topics—the Internet, of course; SCSI Manager 4.3; bugs and glitches; and Apple products, new Apple policies, new Apple anything.

The writing is sharp, concise, colorful: "Microsoft Word 6.0 boasts an impressive feature set that helps it to leap tall buildings—very slowly." What's most compelling about TidBits is its global, interactive, Internet readership; fans reply by E-mail from all over the planet to share their perspectives. (One guy wrote to complain about the keyboard shortcuts in American software, many of which don't work on his Danish keyboard.)

Read this newsletter before buying a new Mac (to see if a newer model is coming out next month). Read it to find out how you can get Apple press releases by E-mail. Or read it to get a five-minute weekly fix on the Mac's position in the universe. (Free; weekly; available as a text file. If you read it using the freeware pro-

gram Easy View, TidBits gains a neat, click-to-navigate table of contents.)

Info-Mac Digest

Don't let the name fool you. This one's not really so much a magazine as it is a free listing. Each week it summarizes what's new in the world of Macintosh—new freeware and shareware, complete with short descriptions and Internet locations, as well as problems and solutions exchanged in E-mail form. For the Mac junkie who's learned how to access the Internet's software vaults via America Online (or who has a direct Internet connection), it's worth skimming.

The Upshot

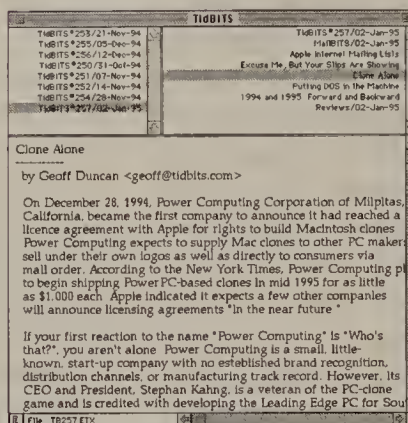
The Internet is one gigantic well-stocked fridge ready for raiding; for some strange reason, people go up there and just give stuff away. These impressive free publications are an excellent case in point. TidBits and DT&G are especially worth reading for pros and power users; Information Alley and MacSense are worth reading no matter who you are.

And you know the best part about reading E-zines? Not a single one of those stupid subscription cards will fall into your lap. **m**

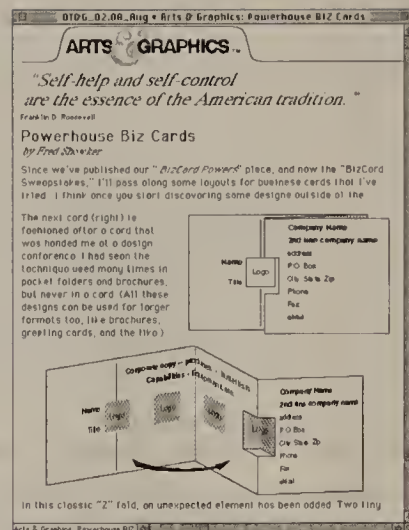
Contributing editor DAVID POGUE does three things every day: write, sleep, and answer E-mail. His latest book is *Mac FAQs [Frequently Asked Questions]* (IDG Books Worldwide, 1995).



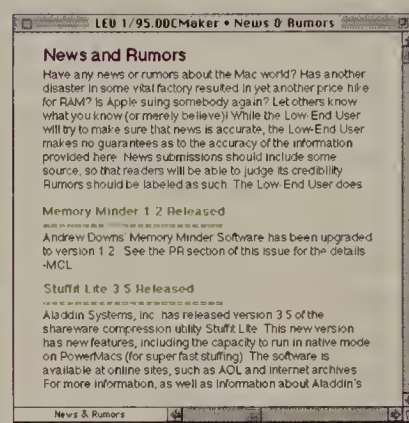
Information Alley



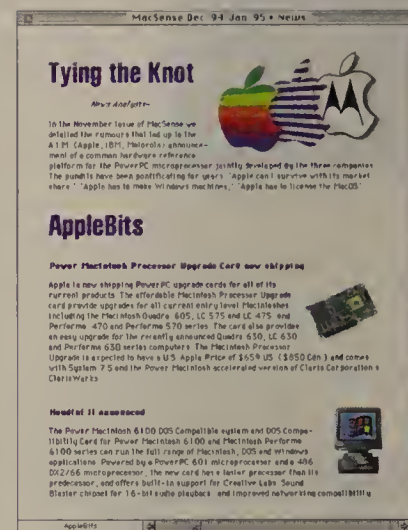
TidBits



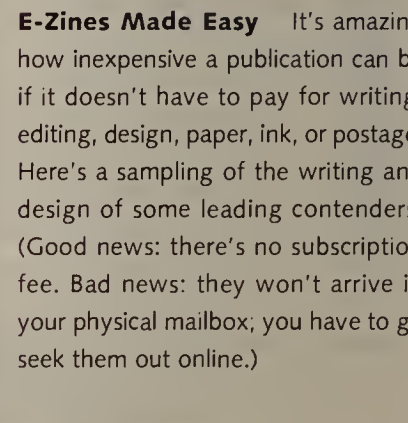
DT&G



The Low-End User



MacSense



MacSense

Signature Software

Personal Font™

The Original Custom Cursive Handwriting Font

Version 2.0

Patent Pending

NEW VERSION

Now Works with ANY printer! Characters connect on screen. PostScript Not Required.*

Font Technology Breakthrough!

Now you can add your own handwriting to the Font Menu! Signature Software's Personal Font is a custom font which can reproduce your handwriting - including the exact way that you shape and connect your letters. This unique patent pending technology will actually vary the shapes of your letters depending on the characters around them. No other font can do this!

PERSONALIZE YOUR CORRESPONDENCE

With Personal Font you can join the personal impact of your own handwriting with the convenience

and power of your personal computer. Imagine running your spell checker on your handwriting! Use your word processor's cut and paste features to polish up your handwritten letters. Add a friendly handwritten P.S. note to your business correspondence. Or even sign your FAX-modem messages!

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For your own Personal Font, simply write the 26 words as well as the capital letters, numbers and punctuation found on the back of this page. From that sampling, Signature Software font designers will individually convert your handwriting into a custom font which duplicates the unique way you create each word - not

just each letter. Your font will include your signature and will even have a name which you specify.

HANDWRITING FROM THE KEYBOARD.

Personal Font captures your handwriting at its best. Your font has the same style and character as your own handwriting - without the inconsistencies and inkblots! With your own Personal Font in the Font Menu you'll find yourself creating handwritten notes without hesitation - straight from your keyboard!

Since each order is custom, please allow two to four weeks processing time. If you're in a hurry, for an extra \$25 Signature Software will ship your order within five working days.

Actual Handwriting vs. Personal Fonts:

Peter's actual handwriting.

Peter's Personal Font.

Peter Matthews - Toronto, ONT

Colin's actual handwriting.

Colin's Personal Font.

Colin Johnson - Portland, OR

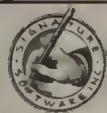
Your Personal Font can be installed and used as simply as an "ordinary" font. It appears in your menu and functions just like any other typeface in your computer.

System Requirements:

Mac - System 6.05 or higher

PC - Windows 3.1

Any printer can be used with Personal Font on a Mac system. Please call for availability of Personal Font v2.0 for Windows systems.



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Hood River, OR 97031 1-503-386-3221

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PHONE

CARDHOLDER'S SIGNATURE

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- Express shipping requires street address and phone number

Available for Macintosh systems only. Windows version available soon.



Famous Last Words

Levy to Apple: Don't drop dead

THIS IS MY LAST COLUMN FOR *Macworld*. After almost ten years in this space, I think I got my message across—the Macintosh is a very nice computer, and people should consider owning one. Now that the Mac operating system is the industry standard, and the nonstarter competing system promulgated by a now-almost-bankrupt software concern in Washington State has seen its market share slip to 3 or 4 percent, there's not much left to write about. Especially since Apple management hasn't made a single mistake in, oh, six or seven years. So I'm retiring.

Oops—sorry. I seem to have slipped in some copy from an aborted April Fools' column. Forget almost everything I said, except for the statement about my departing. It's no joke; I'm beginning a stint as a columnist for *Newsweek*. I will still maintain a relationship with *Macworld*, so you haven't seen the last of me in these pages. But this is my final monthly dispatch.

I'm getting a little *fakleempt* here. . . . Got a cinder in my eye or something. . . . Ah, heck, let me say it—I'll miss you folks. Just give me a minute. There, that's better. No time for maudlin good-byes—I want to use the rest of this space to discuss my hopes and concerns about that machine I've spent so much time pondering. In short, I think that the future of Macintosh could be as glorious as its past—if only Apple's management makes the commitment to believe in it.

The Apple Enigma

Apple is a funny company. It has built itself into a business grossing nearly ten billion dollars a year, with hundreds of millions of dollars in earnings. It has about a billion bucks in cash. Its technology is unparalleled. The brand name Macintosh is the most valuable hardware label in the business. And the successful intro of the Power Macs ensures Apple's status as the maker of the most powerful machines in the marketplace. Yet for the past two years, whenever someone hears that I write for *Macworld*, I am almost inevitably asked, Is Apple doomed?

Of course Apple isn't doomed. While it's not out of the question that at some point it might merge with some other giant—not so much because of weakness, but simply because this is the way the world works these days—Apple is by no means at the precipice. Even if the worst happened, and Apple's market share dwindled, the company could survive as a niche player in a very large market. Apple still holds strong advantages in graphics and education. There will be Macintosh in the twenty-first century. Really.

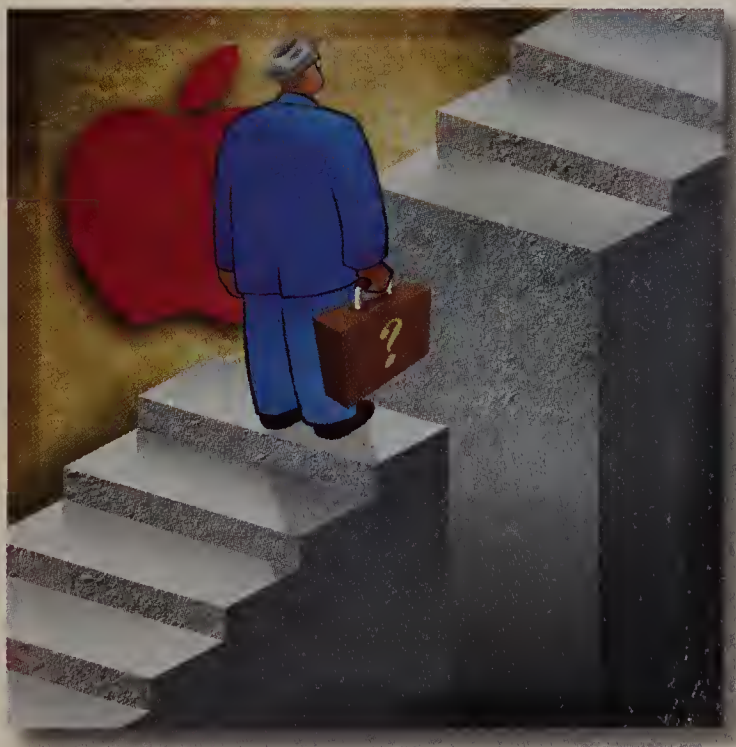
Yet it's troubling that the public perception of Apple is so dismal. I guess it's obvious why some people think so little of the company—about nine out of ten computer users aren't Macintosh users. I won't dwell on the standard reasons why Apple lost the market-share wars (in the

takes a doctorate in engineering to connect a CD-ROM drive to a home computer running Windows. Until Windows 95 arrives, those using non-Apple computers still can't name a file Letter to Grandma. Apple networking is built in; other computers subject networkers to unintended lessons in chaos theory. Why doesn't anyone realize these things? Because Apple for years was too busy pushing computers as a lifestyle choice instead of educating the public on why its products were better than the others. Only recently has Apple decided to focus on why its computers are better—but the company's not being aggressive enough. The only reason I can figure out why Apple didn't jump on the Pentium debacle in its ads is that Apple is hiding some similar horrid flaw in the PowerPC chip—

otherwise there was no excuse for not bashing a key competitor at a crucial moment. If Apple's leaders aren't ready to get tattoos reading “Die, Intel, Die!” they shouldn't be Apple's leaders.

Revive Evangelism.

Hasn't anyone at Apple read Guy Kawasaki? Apple once had a proud get-out-the-software effort that supported third-party vendors and sought out up-and-comers. That spirit should be revived. Instead of whining about how its low market share is driving away software developers, Apple should exploit the



eighties, the Mac cost too much and Apple stubbornly refused to license its operating system—that's water under the bridge. The fact is that there are plenty of things that Apple can do right now to improve its position and ultimately regain its position as the class act of the micro-computer world. Here are a few of them.

The Remedies

Press Your Market Advantage. The Pentium can't do long division, and it's slower than the PowerPC, anyway. It

situation. It should scour start-up companies, university computer centers, and even Silicon Valley garages for potential software superstars, people with great talents and twisted genius. Then whisper in their ears: “Sure, there are a lot more people using DOS and Windows computers—but the competition is tougher, and it's harder to get your product noticed than in the chummy Mac market. If your idea is as great as you think it is, Microsoft will undoubtedly develop a

continues

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product that does the same thing. Do you really want to develop a product that runs on a platform controlled by your eventual competitor?" While the developers digest this logic, Apple should give them computers, development tools, and access to beta copies of new system software. If it helps to evolve one product that's a tenth as good as PageMaker is, the effort will have been more than worth it.

Be Bold. How can you boost market share unless you take daring steps? For most of 1994, Apple had a wonderful product to sell—a powerful color PowerBook. Yet due to Apple's chronic timidity in judging the popularity of its machines, there weren't enough machines available, and prospective customers had to wait weeks or months to get a unit. Who knows how many people gave up and bought IBM ThinkPads. Just imagine what would have happened if Apple concluded that it had a truly great product, invested money so that its factories churned out zillions of units, and cut its prices to flood the market with its best shot. Instead, the dominating motivation was fear of guessing wrong and being stuck with a large inventory.

It's pathetic to see a company founded on the spirit of garage entrepreneurialism now ruled by bean counters. The future has never belonged to accountants—risk-takers rule. So what's the point of all the caution? I'm not a big fan of licensing the operating system (see *The Iconoclast*, January 1995), but if you're going to do it, don't pussyfoot with secondary companies—get it done with IBM, Panasonic, General Motors, or Procter and Gamble. Think big!

Over a year ago I wrote a column strongly urging Apple to make Macintosh the computer associated with the Internet. I urged the company to use all its skill, creativity, and resources to build in full Internet access, with an easy-to-use interface as yet unimagined in the networked world, and even, if necessary, to assure one-step connections to the Net by securing local gateways so people could be surfing the Net with a single button. People within Apple, it turned out, were thinking the same thing. But the idea stalled. Not surprisingly, someone else has decided to run with the bigger, bolder idea—Microsoft. Apple's rival has bought a company to provide the local gateways and has licensed a version of Mosaic to bundle with Windows 95. Apple not only blew a major opportunity but ceded that chance to its competitor. If the corporate heads of Apple care at all, they should examine this blunder carefully, extract a lesson, and immedi-

ately begin playing catch-up. There's no reason why Apple's excellence should not be playing a major role in the information superhighway, and the way to do it is to throw the long bomb. Which brings us to . . .

Innovate, Innovate, Innovate. Apple owes almost all of its success to the superiority of its products. Yet almost every year, it yields a bit more of its lead. We see Michael Spindler actually *bragging* to a *New York Times* reporter that he doesn't think that vision is a terribly important thing. Wrong, Diesel. While sweating the details is crucial, and Spindler does a generally good job at it, Apple's ultimate survival depends on continual innovation. Reliability, service, and a coherent product line are important; but the reason we love Apple is that it delivers magic. That's

*Apple, dazzle and
surprise us. Make our jaws
drop again.*

why it's so disappointing to see delays in the great breakthroughs in telephony, voice recognition, and interface pioneering that Apple has promised us. For Apple, breakthroughs are like breathing—not the kind of thing you postpone. There is still tremendous talent at Apple. Maybe what is needed are the types of managers who can assemble small groups of wizards, convince them they have a chance to change the world, and post some slogans on a blackboard, like "It's better to be a pirate than join the navy," or "Real artists ship." Yes—just like Steve Jobs did with the original Macintosh team.

This is no time to be tentative. We may be living in the most exciting time in human history. Computer technology—and to a degree, Apple technology—is the critical factor. It would be tragic if for lack of nerve, or lack of vision, this remarkable company squandered its legacy and downgraded itself to a footnote in this truly epochal revolution. I beg the Brahmins of Cupertino: Live up to the promise. Dazzle and surprise us. Make our jaws drop again. Don't let us forget why we loved you in the first place. The magic can happen again. Make it happen.

I'll be watching. **m**

STEVEN LEVY's latest book is *Insanely Great: The Life and Times of Macintosh, the Computer That Changed Everything* (Viking, 1994). Levy is a Fellow of the Freedom Forum Media Studies Center in New York.



Cyberspace Lawsuits

Careless words may endanger your career or your bank account

FLAMING, FEUDING, AND FUSSING are common forms of online exchange. I think you're stupid and say so in a public forum. You respond in kind, and soon we're swapping half-baked allegations and counter-charges about each other's parentage, character, and capabilities. Despite the frequency of such exchanges and the passion they inspire, few people call an attorney when they feel wronged online. More often than not, people fight irritating messages by posting more messages of their own.

That's not a bad strategy. But there's no absolute freedom of speech, not even in cyberspace. Careless words could damage your reputation or your career. Add attorneys to the mix, and your bank account may be in peril as well.

Risky Business

Recently, for example, a Prodigy subscriber faced a \$100 million libel suit for comments about the Stratton Oakmont investment bank posted in Prodigy's Money Talk forum. According to Peter Lewis of the *New York Times*, the messages claimed that the investment company would soon shut down because its initial public offering had been illegal. Not true, said Stratton Oakmont. (It turns out, someone else had used the Prodigy member's account; the subscriber has been dropped from the lawsuit, which continues against Prodigy itself.)

In 1994 David Rindos won a \$40,000 judgment in an Australian court against fellow anthropologist Gilbert Hardwick for comments posted on a global academic network. The judge said Hardwick's comments implied that Rindos engaged in sexual misconduct and that "the plaintiff's professional career and reputation has not been based on appropriate academic research but on 'his ability to berate and bully all and sundry.'"

Two other cases also illustrate the trend. Suarez Corporation Industries, which markets itself on the Internet, sued the author of an electronic newsletter last year for calling the company's approach a

"scam." In 1993 MedPhone Corporation filed a \$40 million libel suit against MedPhone investor Peter DeNigris for comments he posted about MedPhone in Prodigy's Money Talk forum. Suarez settled for the court filing fee of \$64; MedPhone and DeNigris paid each other \$1. (Presumably attorneys' fees were higher.)

Of Libel and Privacy Law

The laws that apply to written speech also apply online. Statements that libel, defame, or invade the privacy of others may lead to the same kinds of legal headaches.

The most basic definition of libel is "the dissemination of a false statement of fact about a specific person that is sufficiently serious to damage that person's reputation," according to Kent Stuckey, general counsel for CompuServe.

his wife, it might be true, but you're not entitled to spread it around," says attorney Lance Rose, author of *NetLaw* (Osborne, McGraw-Hill, 1995) and a columnist for *Boardwatch Magazine*.

Private Speech, Public Forum

These issues are old hat to attorneys but may come as a rude surprise to cyberspace rowdies and their bosses. It's easy to spout off online without thinking. What may feel like a private exchange between a few friends is often a very public statement accessible to hordes of unseen people.

"You're just looking at a screen; you don't realize there are millions of faces behind it and some of them might be angry at what you say about them," notes Steven McDonald, associate legal counsel for Ohio State University. "The fact

that it's on a computer is no different than if it is broadcast by a TV station or [published] in a newspaper or in a book."

The hundreds of thousands of members of commercial online services and the millions of people accessing the Internet constitute a nightmare of potential risk. The potential damages for a libelous statement increase with the size of the audience. And according to Stuckey, "unlike with some other forms of communication, it is clearly foreseeable that what you say could be copied and very widely distributed in such a way that your words

can be tracked down to you."

Even if you don't face a lawsuit, careless words could cost you a job. At least two computer professionals have been forced to leave their companies because of their online conduct.

Protective Measures

Avoiding a lawsuit—or job loss—is not difficult if you approach electronic communications sensibly. Before posting a

continues



The key there is "false statement of fact." You can call me a greedy jerk without penalty because that's an opinion, however misguided, and you're legally entitled to it. But if you claim I'm a greedy jerk who rips off my customers, you're making a factual claim that implies I am guilty of criminal wrongdoing. If that's not true, you could face hefty charges.

Even true statements can run afoul of the law because people have a right to privacy. "If you say someone is cheating on

Keep the Flame Alive

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CONSPICUOUS CONSUMER

public statement or even sending private E-mail, which could be copied and posted publicly by the receiver (or monitored by your boss), consider these questions.

Is It True? Readers sometimes complain to *Macworld* that some companies practice bait-and-switch tactics or that others are going out of business. You may be angry that a company no longer has a particular product for an advertised price, but that does not necessarily translate into a bait-and-switch move, which has a specific legal meaning. And it may be hard to believe that a company not answering its phones is still in business, but a staff shortage or phone problem could explain the situation. Check your facts—don't make assumptions.

Is It Relevant? John Doe was accused of sexual harassment several years ago at a company where you used to work. Now he's at a new firm and is active online. Though you're eager to share this history with your online buddies, don't. An invasion-of-privacy lawsuit might be the result.

Is It Damaging? Rumors can drive down the stock prices of a publicly traded company, such as MedPhone, or threaten the professional reputation of an individual, as David Rindos feared. Ponder the possible impact of your words before you hit that Send button.

Would Mom Approve? It's easy to respond in kind to a thoughtless message, especially if you're angry. Try counting to ten first. Whenever you post a message, ask yourself if it's inflammatory, sneering, or rude. What would your mother say if she saw it? Or your boss? Tone alone may be enough to trigger a lawsuit by a particularly sensitive soul. (To be safe, ask a coworker to review the message before it goes out.)

People rarely sue over these issues. "You're not going to find libel lawsuits unless someone is really, really upset," says attorney Robert Hamilton, a libel specialist with the law firm Jones, Day, Reavis, and Pogue in Columbus, Ohio. "If you can remove the emotions from the case, generally there won't be a lawsuit," says Hamilton. Acting arrogant or hostile may up the odds of court action, whereas a willingness to apologize, correct inaccurate information, or remove the offensive posting may resolve the dispute.

Legally, companies can be held responsible for actions employees perform in the course of their jobs. That means managers may find themselves at risk for lawsuits sparked by an employee's negligence.

To protect themselves, companies may want to establish a policy banning the use of personal E-mail or limiting elec-

tronic communications to subjects directly related to work. A less drastic approach is asking employees to include a disclaimer on electronic messages making it clear that employees are speaking as individuals and not as company representatives.

If all precautions fail and you do face a lawsuit, find a net-surfing attorney who's an expert in libel and related issues. You don't want to bankroll the education of a less-experienced lawyer.

Future Shock

Cyberspace may yet pose some interesting twists to established law; one issue is jurisdiction. "It's actually very hard to win a libel suit in this country," says McDonald. "The problem is, when you're online you may not be in this country."

A case in point: Usenet newsgroups exist on servers around the globe. That's a fact Laurence Godfrey is attempting to use to his advantage. The Canadian academic recently filed a libel suit in London against another academic who lives in Geneva, based on what Godfrey claims is a defamatory Usenet message.

Libel cases are much easier to win in Britain than in the United States, in part because the United Kingdom has no First Amendment guarantee of freedom of expression. Moreover, there the burden of proof is on the defendant, not the plaintiff. But as a practical matter, Godfrey may be unable to collect damages even if he wins the suit.

In the future, there may be alternatives to a courtroom battle, according to Mark Walsh, president of GENIE Services. "I think the marketplace will create a solution to libel, and it won't be lawsuits," he says. "We're going to have to have a marketplace yardstick of what is reliable and what isn't." One possibility: a kind of *Consumer Reports*-like reliability index, which would inform readers of the expected truthfulness or accuracy of a particular message. Highly factual folks might get a 9.9 rating on their messages, while those prone to exaggeration or unknown to the system might get a 1.1.

A lawsuit-free zone sounds appealing, but it's unlikely. So mind your manners while online. The job you save may be your own. **m**

You can write to contributing editor DEBORAH BRANSCUM, *Macworld's* Conspicuous Consumer, at *Macworld*, 501 Second St., San Francisco, CA 94107, or via the Internet (branscum@aol.com).

Send nominees for sainthood to *Service Heroes*, *Macworld*, 501 Second St., San Francisco, CA 94107, or via the Internet (branscum@aol.com). Also, drop *Conspicuous Consumer* a line if a company is ignoring you.



Editors' Choice

THE BEST PRODUCTS FEATURED IN MACWORLD

Edited by Elizabeth Maffly

Macworld Editors' Choice is a complete listing of the hardware and software products selected as the best of their type in *Macworld's* comparative articles. A + next to a product indicates that we chose more than one product in that category. A Ⓢ next to a product listing indicates that a native Power Mac version is available.

Hardware

MONITORS

SMALL COLOR MONITORS, Jan 94

14-inch display: + Sony CPD 1430; Sony Corp. of America, 800/222-7669; \$779.95.

+ Nanao FlexScan F340i•W; Nanao USA, 800/800-5202; \$799.

15-inch display: NEC MultiSync 4FGe; NEC Technologies, 708/860-9500; estimated street price \$755.

TWO-PAGE COLOR MONITORS, Nov 94

PressView 21 Display System; SuperMac Technology, 408/541-6100; \$3999.

NETWORK HARDWARE

REMOTE-ACCESS SERVERS, Oct 94

Mixed networks: NetConnect Remote Access Server; Asanté Technologies, 408/435-8401; \$3899 for eight ports.

AppleTalk networks: ARA Multiport Server; Apple Computer, 408/996-1010; four ports \$1799, eight ports \$3298.

PRESENTATION HARDWARE

PORTABLE PRESENTERS, Jan 95

Z115; nView, 804/873-1354; \$5495.

PRINTERS

COLOR PRINTERS, Aug 94

Low-end ink-jet: DeskWriter 560C; Hewlett-Packard, 800/752-0900; \$719.

Solid ink-jet: Phaser 300i; Tektronix, 503/682-7377; \$9995.

Thermal-wax transfer and color laser: Phaser 220i; Tektronix, 503/682-7377; \$5995.

DYE-SUBLIMATION PRINTERS, Jul 94

Prepress proofing—tabloid size/fastest: Phaser 480; Tektronix, 503/682-7377; \$14,995.

Prepress proofing—tabloid size/most complete:

Rainbow; 3M, 612/733-1110; estimated street price of \$20,000.

Prepress proofing—letter size: ProofPositive Full Page; SuperMac Technology, 408/541-6100; \$7999.

General publishing and business: Phaser IISDX; Tektronix, 503/682-7377; \$9995.

PERSONAL PRINTERS, Sep 94

Ink-Jet: DeskWriter 520; Hewlett-Packard, 800/752-0900; \$365.

Laser—\$1000 to \$1600: microLaser Pro 600; Texas Instruments, 214/995-6611; \$1599.

WORKGROUP PRINTERS, Feb 94

High-speed: Hewlett-Packard 4Si MX; Hewlett-Packard, 800/752-0900; \$5499.

Best buy: + Apple LaserWriter Pro 630; Apple Computer, 408/996-1010; \$2529. + Hewlett-Packard LaserJet 4M; Hewlett-Packard, 800/752-0900; \$2329.

SCANNERS/IMAGE CAPTURE

ELECTRONIC CAMERAS, Sep 94

Apple QuickTake 100; Apple Computer, 408/996-1010; \$749. Ⓢ

HIGH-BIT FLATBED COLOR SCANNERS, Mar 95

+ Arcus II; Agfa, 508/658-5600; \$3495.

+ PowerLook; Umax, 510/651-8883; \$3495.

LOW-COST COLOR SCANNERS, Nov 93

\$1300 to \$1600: + La Cie Silverscanner II; La Cie, 503/520-9000; \$1599.

+ Hewlett-Packard ScanJet IIc; Hewlett-Packard, 800/752-0900; \$1599.

Under \$1300: Mirror 800 Plus Color Scanner; Mirror Technologies, 612/633-4550; \$1299.

OCR, Nov 93

OmniPage Professional; Caere Corp., 408/395-7000; \$995. Ⓢ

SYSTEMS/STORAGE

1.3GB OPTICAL STORAGE, Dec 94

Best low-cost solution: 1.3Gig MO; Club Mac, 714/768-8130; \$2099.

Best overall performance: Genesis 1300; Microtech, 203/468-6223; \$2899.

HIGH-SPEED HARD DRIVES, Aug 93

2.7GB drives: + Nova XL 2700; Microtech, 203/468-6223; \$2999. + Vista 3.5GB; Relax, 510/471-6112; \$3499.

SCSI-2 adapter: QuickSCSI; PLI, 800/288-8754; \$499.

PC COPROCESSING, Oct 94

OrangePC Model 210; Orange Micro, 714/779-2772; \$1283.

RAID STORAGE SYSTEMS, Apr 95

RAID 3 or 5: MR/5 RAID; MegaDrive Systems, 310/247-0006; \$18,840.

RAID 0: SledgeHammer 2000FMF; FW8, 415/474-8055; \$2359.

SYSTEM UPGRADES, Feb 95

Upgrade for Macintosh Quadra 650, 800, or 950: Power Macintosh Upgrade Card; Apple Computer, 408/996-1010; \$699.

Upgrade for other 680X0 Macs: Replace with Power Macintosh 6100/60 with CPU booster and cache card. Power Macintosh 6100/60; Apple Computer, 408/996-1010; \$1819 (base system with 8MB of RAM). PowerClip (CPU booster); Newer Technology, 316/685-4904; \$245. 256K cache card; various companies, roughly \$200.

VIDEO/DISPLAY

24-BIT VIDEO CARDS, Apr 94

Inexpensive acceleration: PrecisionColorPro 24XP; Radius, 408/434-1010; \$599.

Full-featured acceleration: Thunder II GX•1360; SuperMac Technology, 408/541-6100; \$4499.

HIGH-END VIDEO EDITING, Jun 94

Presentation video: + MoviePak2 Pro Suite; Raster-Ops, 801/785-5750; \$4199. + VideoVision Studio; Radius, 408/434-1010; \$4499.

Corporate video (offline): Media Composer 400s; Avid Technology, 508/640-6789; \$14,995.

Corporate video (online): VideoCube; ImMix, 916/272-9800; \$40,500.

PHOTOSHOP ACCELERATORS, Apr 94

Photo8ooster; Radius, 408/434-1010; \$999.

Software

ACCOUNTING/FINANCE

GROWING A SMALL BUSINESS, Nov 93

Small-business system: M.Y.O.B.; Best Ware, 201/586-2200; \$199.

Home office/personal finance: MacMoney; Survivor Software, 310/410-9527; \$119.95.

continues


Editors' Choice

BUSINESS TOOLS

PORTABLE-DOCUMENT SOFTWARE, Apr 95

Document Distribution: Common Ground 1.1; No Hands Software, 415/802-5800; \$189.95.

STATISTICS, Oct 93

Exploratory data analysis: DataDesk 4.1; Data Description, 607/257-1000; \$595. 

Comprehensive package: SYSTAT 5.2.1; SYSTAT, 708/864-5670; \$895.

CD-ROM

TOP 10 CD-ROMS, Mar 94

Overall: Seven Days in August; Time Warner Interactive Group, 818/955-9999; \$79.99.

COMMUNICATIONS/NETWORKS


COMMUNICATIONS SOFTWARE, Aug 94

Basic connectivity: ZTerm; David P. Alverson (no phone number available); \$30.

Terminal emulation: Crosstalk for Macintosh; Digital Communications Associates, 404/442-4000; \$195.

Internet exploration: VersaTerm; Synergy Software, 215/779-0522; \$125.

DOS WINDOWS EMULATION, Oct 94

Timbuktu Pro 1.0.3 for Macintosh, Timbuktu 1.1 for Windows; Farallon Computing, 510/814-5000; \$199 each. 

HIGH-SPEED FAX MODEM SOFTWARE, Oct 93

Faxstf; Telefocus, 816/886-9800; \$79.

NETWARE CONNECTIVITY, Sep 93

NetWare for Macintosh; Novell, 801/429-7000; \$495 for 5-user license to \$2295 for 200-user license.

PROTOCOL ANALYZERS, Jul 94


EtherPeek, AG Group, 510/937-7900; \$795.


TERMINAL EMULATOR, Oct 93


VersaTerm; Synergy Software, 215/779-0522; \$149.

GRAPHICS

3-D MODELING, Dec 94


Stand-alone modeler: formZ; autodessys, 614/488-9777; \$1495. 


Integrated-modeling package: Strata StudioPro; Strata, 801/628-5218; \$1495. 


Entry-level modeler: Infini-D; Specular International, 413/253-3100; \$695. 


CLIP ART'S GREATEST HITS, Jan 94

Overall collection:  ClickArt Studio Series; T/Maker Company, 415/962-0195; \$99.95 per volume.

 Electronic Clipper subscription service; Dynamic Graphics, 800/255-8800; \$67.50 per month.

 Metro ImageBase Electronic Clip Art; Metro Image-Base, 800/525-1552; \$74.95 per volume, CD-ROM

\$149.95.  Images with Impact series; 3G Graphics, 800/456-0234; \$99.95 to \$129.95 per volume, CD-ROM \$499.


 Typographers' Ornaments; Underground Grammarian, 609/589-6477; \$25 per volume; ten TIFF albums \$200; EPS volumes \$50 each.

DRAW PROGRAMS (LOW-COST), Sep 93

Budget draw: Expert Draw; Expert Software, 305/567-9990; \$49.95.

Budget draw/paint: UltraPaint; Deneba Software, 305/596-5644; \$79.

Beginners' program: Aldus SuperPaint; Aldus Consumer Division, 619/558-6000; \$149.95.

Overall: Canvas; Deneba Software, 305/596-5644; \$399. 


FONT BUYERS' GUIDE, Mar 94

Text-face collection: Type On Call CD-ROM; Adobe Systems, 415/961-4400; \$99 (this price includes the ability to unlock two families from preselected packages); an additional \$25 enables you to unlock individual faces, or \$69 to \$179 for unlocking families.

Display/decorative-face collection: Fontek; Letra-set, 201/845-6100; \$39.95 per face.

Bargain collection: Monotype ValuePack; Monotype, 312/855-1440; \$89 for 57 fonts.

IMAGE DATABASES, Oct 93

 Aldus Fetch 1.0; Adobe Systems, 206/628-5739; \$295.



 Multi-Ad Search 2.0; Multi-Ad Services, 309/692-1530; \$249.

IMAGE EDITORS, Feb 95

Adobe Photoshop 3.0; Adobe, 415/961-4400; \$895. 

INTEGRATED SOFTWARE

INTEGRATED SOFTWARE, Feb 94

ClarisWorks; Claris Corporation, 408/727-8227; \$299. 

ONLINE SERVICES



ONLINE SERVICES, Aug 94

E-mail: America Online; America Online, 703/893-6288; basic monthly fee \$9.95.

Reference: CompuServe; CompuServe Information Service, 614/457-0802; basic monthly fee \$8.95.

ORGANIZATION/PRODUCTIVITY


CALENDARS, Jul 93

Alarm system:  First Things First; Visionary Software, 503/246-6200; \$79.95.  Smart Alarms Plus; JAM Software, 203/630-0055; \$75.


All-around scheduler: Now Up-to-Date; Now Software, 503/274-2800; \$99.


Meeting scheduler: Meeting Maker; On Technology, 617/374-1400; five-pack \$495.

GRAPHING SOFTWARE, Aug 94

DeltaGraph Pro 3 3.0.4; DeltaPoint, 408/648-4000; \$195. 

SALES-AUTOMATION SOFTWARE, Oct 93

 Contact Ease; WestWare, 619/274-5053; one user \$395, five users \$1495.

 CBS; Colleague Business Software, 512/345-9964; \$495.


TEXT-RETRIEVAL SOFTWARE, Dec 93

Small system: On Location; On Technology, 617/374-1400; \$129.

Multiuser system: Personal Librarian; Personal Library Software, 301/990-1155; \$995.

PRESENTATION TOOLS

PRESENTATION SOFTWARE, Jul 94

Persuasion 3.0; Adobe Systems, 206/622-5500; \$495. 

UTILITIES

BRAVE NEW DOCUMENTS, Jan 94


Application-independent document distribution: Common Ground; No Hands Software, 800/598-3821; \$189.95.

Book-length documents: FrameReader; Frame Technology, 800/843-7263; \$84.95.

PRINTING, Sep 93

PC-printer cable packages: PowerPrint; GDT Softworks, 604/291-9121; \$149.

VIRUS KILLERS, Jul 94


Commercial software: Virex; Datawatch, 919/549-0711; \$99.95. 

Free software: Disinfectant; free from various online services.

VIRTUAL MEMORY SOFTWARE


VIRTUAL MEMORY, Jun 94

Virtual memory software: Virtual 3.0; Connectix Corp., 415/571-5100; \$99.


Memory-boosting software: RAM Doubler 1.0.1; Connectix Corp., 415/571-5100; \$99. 

WORD PROCESSORS

HIGH-END WORD PROCESSOR (for fast 68040 Macs and Power Macs), Mar 95

Microsoft Word 6.0; Microsoft Corporation, 206/882-8080; \$325. 

LOW-COST WORD PROCESSOR, Mar 95


MacWrite Pro; Claris Corporation, 408/727-8227; \$99.  

Vendors: Please write to *Macworld Editors' Choice*, 501 Second St., San Francisco, CA 94107, or send a fax to 415/442-0766 to inform us of changes in your phone number or your product's list price.

Star Ratings

HARDWARE AND SOFTWARE REVIEWS AT A GLANCE

Edited by Wendy Sharp


Macworld Star Ratings lets you compare Macintosh products by providing summaries of *Macworld's* authoritative product reviews from the past year. The number of stars indicates quality; our reviewers assign five stars to outstanding products and one star to poor ones. The  symbol indicates that a product is available in a native Power Mac version.

If a product has been upgraded since our last review, the most recent version number supplied by the vendor appears in parentheses after the reviewed version number. To read a full review of any product in the listing, please consult the issue listed at the end of each synopsis.

Vendors: Please write to *Macworld Star Ratings*, 501 Second St., San Francisco, CA 94107 to inform us of changes in the version number or list price of your product, or of changes to your phone number.

Software

BUSINESS TOOLS

★★★★ **4D First 1.0 (1.0.1), ACI US, 408/252-4444, \$295.** This entry-level relational database is a low-cost way to distribute the power of 4D and 4D Server to an office full of Macs. May 94 

★★★★ **AccuZip6 1.8.7, Software Publishers, 800/233-0555, \$689.** Bulk-mail software has informative progress indicators, batch and individual processing, low rates, and flexible parsing during import, but the interface is incomprehensible. Sep 94

★★ **Adobe Acrobat 2.0, Adobe Systems, 415/961-4400, \$195.** The font fidelity of this portable-document software is uneven, and the software demands too much in resources compared with other options. Mar 95


★★★★ **Adobe Acrobat for Workgroups 2.0, Adobe Systems, 415/961-4400, \$1595.** As a collaboration tool, this software is relatively inexpensive and offers well-done annotation tools. However, it's resource-intensive, and creating hypertext documents with it isn't easy. Mar 95


★★ **BaseMap 1.0.1, GeoPoint, 415/957-1560, \$149.** For simple maps displaying simple data, this map-making tool may be useful. It's not for the cartographic sophisticate, however. May 94

★★ **Bulk Mailer CASS 1.00d, Satori Software, 206/443-0765, \$150.** Unattended operation is possible with this bulk-mail software, but batch processing is slow and the program has coding problems. Sep 94

★★★★ **CA-Cricket Graph III 1.52, Computer Associates International, 516/342-5224, \$129.** Graphing software's features are just right for charts in the physical and social sciences, but lack pizzazz. The program

is easy to learn and use, and includes math features for data transformations and curve fitting. Dec 94

★★★★ **ClarisImpact 1.0 (1.0 v3), Claris Corp., 408/727-8227, \$399.** Business graphing, project management, object-oriented drawing, word processing, and presentation functions merge in this business graphics software. The outstanding integration offers versatility that dedicated programs are pressed to match. Jun 94 


★★★★ **ClarisWorks 3.0, Claris Corp., 408/727-8227, \$129.** Inexpensive, easy to use, and powerful integrated software is the best package available. It's far better in terms of features, speed, integration, and use of system resources than its competition. Feb 95 

★★★★ **Crystal Ball 3.0, Decisioneering, 303/449-5177, \$295.** Compact business-simulation software is fast enough for complex projects and can pay for itself in disaster-avoidance in a variety of business tasks. Oct 94

★★★★ **Decision Analysis 2.5, TreeAge, 800/254-1911, \$379.** Decision-assistance software handles complex business cases by constructing tree diagrams of probabilities and payoffs. It offers a type of modeling that is realistic and easy to modify. Nov 94

★★★ **Extend+BPR 3.0, Imagine That, 408/365-0305, \$990.** Business-modeling software includes superior templates for business-process reengineering, but some programming experience is helpful. Oct 94

★★★ **FastTrack Schedule 2.1, AEC Software, 703/450-1980, \$279.** Simple project-management software is ideal for managers who need to put together a schedule quickly and easily, but if you require more power to manage conflicts, you'll need a more comprehensive program. Sep 94

★★★★ **Helix Express 2.0.1 (2.0.4), Helix Technologies, 708/465-0242, \$589.** Icon-based relational-database software's improved performance makes it a serious competitor for all-Mac networks. Especially notable is its much faster speed; multiuser operation is downright snappy. Jul 94 


★★★ **InfoDepot 2.0, Chena Software, 610/770-1210, \$295.** All-in-one program for project planning includes tools for brainstorming and organizing ideas; scheduling project steps; and entering, calculating, and presenting data. It does a good job but has some flaws. Jan 95

★★★ **Map II 1.5, ThinkSpace, 519/858-5047, \$395.** Well-structured program has most of the functions a simple geographical information system needs and is suitable for introductory instruction in GIS. May 94

★★★★ **MarcoPolo 3.0, Mainstay, 805/484-9400, \$895.** Full-featured document-management system is significantly improved. The addition of OCR—both the handling of unrecognized words and the ability to batch-process TIFF files with OCR—make it very usable. Jan 95

★★★★ **MicMac 2.0v1, Nirvana Research, 408/459-9663, \$89.** The concept of Mac as dictation ma-

chine is undeniably attractive, and Nirvana Research has pulled it off well. It takes lots of hard drive space to save recordings, though. Nov 94

★★★★ **Microsoft Excel 5.0, Microsoft Corp., 206/882-8080, \$339.** Although the feature set of this Power Mac spreadsheet is stunningly rich, the system requirements for a full install are jaw-dropping, including 27MB of hard drive space plus 24MB of RAM without virtual memory. Still, it is relentlessly complete. Jan 95 

★★★ **Microsoft Works 4.0, Microsoft Corp., 206/882-8080, \$99.95.** Although this isn't the best integrated package around, it's a sensible, low-cost choice. It offers a respectable word processor, database, spreadsheet, calendar, and address book, as well as a slide-show module, and drawing and communications tools. Jan 95

★★★★ **Pablo 2.0.1 (2.03), Andyne Computing, 613/548-4355, \$695.** Effective end-user data-reporting tool creates a considerable workload but sidesteps the hassles of SQL data access and produces great reports with minimal effort. Jul 94

★★★ **Street Atlas USA 2.0, DeLorme Mapping, 207/865-1234, \$169.** For the most part, this geographical information software delivers what it promises at a great price. Oct 94

★★★ **TeamFlow 3.1, CFM, 617/275-5258, \$295.** Total Quality Management flowchart software is a valuable business tool. Its report printing and customizability are limited, however. Nov 94

★★★★ **TopDown 4.0 (4.1), Kaetron Software Corp., 713/298-1500, \$345.** Flowcharting program's support for custom symbols and automatic drawing aids, along with its ability to let you easily create and navigate lower-level charts, make it a productive tool. Jul 94

★★★★ **ZipZapp 1.0, True Basic, 603/298-8517, \$39.95.** You can use this data-reference utility to find an area code, the correct spelling of a city's name, and more. The interface is intuitive, and the cost, low. Oct 94

★★★ **ZP4 12.1 (14), Semaphore Corp., 408/688-9200, \$125.** Inexpensive bulk-mail software supports batch and individual processing, but the progress indicators are uninformative, and unattended operation requires extra work. Sep 94

COMMUNICATIONS/NETWORKS

★ **BLAST Professional, BLAST Inc., 919/542-3007, \$139.** Our reviewer could not get this telecom software to work reliably and consistently during his tests, and found the minimalist and quirky interface frustrating. Jan 95

★★ **HoloGate 1.0, Information Access Technologies, 510/704-0160, \$500.** Two unique features—UUCP and Usenet news distribution—are the *continues*

Star Ratings

primary reasons to consider this product. Otherwise, it comes up price-rich and feature-poor. **Apr 95**

★★★ **The Internet Companion, The Voyager Company, 914/591-5500, \$29.95.** Well-written, HyperCard-based electronic book offers less information than others. Internet access is available through accompanying software, but it's a terminal-emulation screen. **Dec 94**

★★★★ **Internet Explorer Kit and Internet Starter Kit, Hayden Books, 317/581-3500, \$29.95 each.** Well-written books and useful software combine to produce one of the best introductions to the Internet available for Mac users. **Dec 94**

★★★★ **Internet Membership Kit, Ventana Media, 919/942-0220, \$69.95.** If you need access to the Internet, this book and software combination is a good package. The best part about it is its included preconfigured software. **Dec 94**

★★★★ **MicroPhone Pro 2.0, Software Ventures Corp., 510/644-3232, \$295.** The new feature set of this communications package includes multiple sessions, faxing, TCP/IP networking, and more, but it's a mixed bag. Not all the features are well integrated, although some are innovations for which users will be grateful. **Oct 94**

★★★★ **NetWorks 3.0.4, Caravelle Networks Corp., 613/225-1172, \$1395 to \$2495.** For networks that sprawl across buildings or states, this network-monitoring utility is an indispensable tool. It continually polls devices, checking CPUs, routers, printers and hubs for signs of life. **Apr 95**

★ **PowerShare Collaboration Servers, Apple Computer, 408/996-1010, \$999.** Before this collaboration software will be ready for prime time, Apple needs to overhaul the complex Admin application, add serious diagnostic aids, provide comprehensive documentation, and offer knowledgeable technical support at a price less than that of the program itself. **Aug 94**

★★★ **QuickMail 3.0, CE Software, 515/221-1801, \$199 to \$3799.** If you're shopping for a first-time E-mail application, this product is a good choice for ease of use and setup. The most promising new tool, rules-based messaging, lacks some important features. **Jan 95**

★★★ **RunShare, Run, Inc., 408/353-8423, \$199 to \$2499.** System extension endeavors to pump up file-transfer speeds across both local- and wide-area networks. It offers twofold to threefold throughput gains for fast Macs and large files but is less useful with small files or slow Macs. **Feb 95**

★★★ **Snap Mail 1.0.1, Casady & Greene, 408/484-9228, \$200 to \$1440.** Software will put you on the electronic-mail trail more easily and more cheaply than any competing product, if you can live with some minor (but surprising) shortcomings. **Jun 94**

★★ **SoftWindows 1.0, Insignia Solutions, 415/694-7600, \$499.** You can run Windows software on a PowerMac with this emulation software, but although it's a viable solution, you pay the price in terms of performance, compatibility, and actual cost. **Aug 94** ☹

★★★★ **Timbuktu Pro 1.0 (1.05), Farallon Computing, 510/814-5000, \$199 to \$1999.** Terminal emulation product is a must-have for people who need direct connection to computer systems on a variety of networks. **May 94** ☹

★★ **TrafficWatch II 2.0 (2.1), Neon Software, 510/283-9771, \$495.** The price of this AppleTalk traffic monitor is closer to that of full-blown network analyzers that do much more, albeit with greater complexity. Without printing, alarms, triggers, or true multiprotocol support, this product misses the mark. **Jun 94**

★★★★ **White Knight 12.0, The FreeSoft**

Company, 412/846-2700, \$139. While this telecom software can be bewildering, it works impressively well. If you're willing to read the manual from cover to cover, the program may become your favorite telecom tool. **Nov 94** ☹

DESKTOP PUBLISHING

★★ **CheckPost 1.3, Working Software, 408/423-5696, \$249.95.** Interface aside, this imagesetter-simulation software is generally disappointing. It can't automatically scale pages, it prints on a single sheet, and its error reporting is limited. **Nov 94**

★★★ **ClickBook 1.1, BookMaker Corp., 415/354-8161, \$69.95.** If you need to create inexpensive booklets quickly and without hassle, this print utility that helps you format documents in double-sided booklet form is an excellent tool. **Nov 94**

★★★★ **Download Mechanic 1.0.2, Acquired Knowledge, 619/587-4668, \$249.** The strengths of this PostScript downloader lie in its tools for dealing with problem files, but when dealing with large files, it performs slowly and occasionally crashes. **Feb 95**

★★★★ **FontChameleon 1.0.1 (1.5), Ares Software Corp., 415/578-9090, \$295.** Font utility introduces a new font-creation technology; it builds serif and sans serif fonts from a master outline file. It offers high-quality renditions of popular fonts, plus the ability to customize fonts. **Sep 94**

★★★ **FontMixer 1.0, Monotype Typography, 312/855-1440, \$79.** Although a tad expensive for a one-trick pony, this font utility is a straightforward, relatively painless way to mix characters from different fonts to create composite fonts. **Oct 94**

★★★★ **Fontographer 4.0.4 (4.1), Altsys Corp., 214/680-2060, \$495.** No other font editor does more or works better than this one. For the price of a few font families, it can give you a universe of unique faces. **Oct 94** ☹

★★★★ **LaserCheck 1.0, Systems of Merritt, 205/660-1240, \$199.** Imagesetter-simulation software can save you hundreds of dollars, and many hours, on imagesetting jobs by letting you use a laser printer to proof your work. **Nov 94**

★★★★ **Let'er RIP 2.0, Lupin Software, 916/756-7267, \$239.** The flexibility, clean implementation, and attention to detail of this PostScript downloader make it a pleasure to use. **Feb 95**

★★★★ **PageTools 1.0, Extensis Corp., 503/274-2020, \$129.** Collection of ten PageMaker Additions is packed with utility. Many users will find the PageAlign, PagePrinter, and PageRulers Additions alone worth the price, and the others frosting on the cake. **Dec 94**

★★★ **ReadySetGo 6.0.2, Manhattan Graphics Corp., 914/725-2048, \$395.** There's no strong reason not to use this desktop publishing software if its tools meet your needs, but there's no compelling reason to choose it, either. Its low price is nice, but not enough. **Oct 94**

EDUCATION/ENTERTAINMENT

★★★★★ **A.D.A.M. The Inside Story, A.D.A.M. Software, 404/980-0888, \$79.95.** Multimedia anatomy CD-ROM teaches basic anatomy and physiology with a tantalizing mix of sound, graphics, and animation. If you are the least bit interested in learning more about how the human body works, buy this program. **Mar 95**

★★★ **Aquazone 1.0, Inago, 416/487-4005, \$79.95.** The fish in this aquarium simulation are beauti-

ful, but they're darned hard to keep alive. Only two varieties of fish are included. **Jan 95**

★★★★ **Creative Writer 1.0, Microsoft Corp., 206/882-8080, \$64.95.** Graphics/page-layout/word-processor hybrid offers some terrific type effects, zany sounds, and bright graphics. While it doesn't teach kids to be better writers, it does encourage them to develop ideas and provides a fun vehicle to express those ideas creatively. **Sep 94**

★★★★ **Crossword Wizard 1.0, Cogix Corp., 415/454-7217, \$49.95.** If you're a crossword fan, this crossword-puzzle generator is a must. Although it's not perfect, the play mechanics are fantastic. **Dec 94**

★★★ **The Cruncher, Davidson & Associates, 310/793-0600, \$59.95.** If you want to teach a child spreadsheet basics, this combination educational spreadsheet and business application will do the job. It's creative and easy to use, but slow. **Aug 94**

★★★★ **Crystal Crazy, Casady & Greene, 408/484-9228, \$49.95.** Ultraglossy, superpolished version of the classic Crystal Quest is challenging and fun without being overly difficult. Each level retains some old elements, and adds some new ones to keep you on your toes. **Jun 94**

★★★ **CyberBoogie, Times Mirror Multimedia, 314/531-2503, \$49.95.** The easy interface, bouncy songs, and cute graphics of this children's animation software make it a good choice for very young kids, but its relative lack of features restricts it to the same group. **Apr 95**

★★★ **Firefall Arcade 1.0 (1.0.2), Inline Software, 617/935-1515, \$49.95.** If you loved the classic video game Centipede, or are just looking for a fun shoot-'em-up, this arcade-style game will satisfy. **Jun 94** ☹

★★★★ **Grolier Multimedia Encyclopedia, Grolier Electronic Publishing, 203/797-3530, \$395.** CD-ROM encyclopedia has excellent search capabilities, weighs much less than a shelf of books, and is lots of fun. Its timeliness and some hierarchical snafus were slight problems. **Jul 94**

★★★ **Kids World, Bit Jugglers, 415/968-3908, \$30.** Although the painting tools could be more robust, this screen-saver-creation tool for kids is easy to use, cleverly designed, and can keep kids busy for hours. **Mar 95**

★★★★ **SimCity 2000, Maxis Software, 510/254-9700, \$54.95.** In essence, your goal with this marvelous city-simulation software is to build a city and run it successfully. The game is fascinatingly complex, but it's simple to use, and the elaborate graphics are so lovely that it's even fun just to watch. **Jun 94**

★★★ **Small Blue Planet 1.2.1, Now What Software, 415/885-3432, \$79.95.** Nicely integrated collection of beautiful Earth-from-space images on CD-ROM lacks many features of standard atlases and doesn't have a search function, but is endlessly fascinating. **Jul 94**

★★★★ **Spin Doctor (1.0), Callisto Corp., 508/655-0707, \$59.95.** In the tradition of the best Macintosh games, this game tests your wits and reflexes alike. It's part strategy game, part kinetic sculpture. **Jun 94**

★★★★ **WarPlanes 1.0, Maris Software, 800/336-0185, \$69.** Wonderful multimedia CD-ROM tours the post-WWII era in military aviation. As well as pictures and text, it includes rotatable models of aircraft, an extensive database, campaign maps, historical narration, live combat audio, and three flight simulators. **Mar 95**

★★★★ **Widget Workshop, Maxis Software, 510/254-9700, \$44.95.** Fiendishly clever mad scientist's laboratory allows you to build Rube Goldberg-style widgets out of metronomes, switches, light bulbs, and much more. It encourages imagination and exploration, plus kids think its cool. **Apr 95**

FINANCE/ACCOUNTING

★★ **Financial Competence 1.5, Competence Software, 603/435-5098, \$99.** Business economics tutorial explains how financial statements are compiled and how they relate to each other. Jul 94

★★★ **MacMoney 4.01, Survivor Software, 310/410-9527, \$89.95.** Personal-finance software has new and improved features that will please longtime users, but it hasn't kept up with the leaders in the field and won't win many new converts. Jul 94

★★★ **Managing Your Money 6.0, MECA Software, 203/255-1441, \$79.95.** Personal-finance program does a good if somewhat roundabout job of keeping track of your total financial picture. Although it isn't as easy to use as the competition, it excels in tax, investment, and financial planning. Jun 94

★★★★ **Quicken 5.0, Intuit, 415/322-0573, \$49.95.** The addition of a calendar and new ease-of-use features keep this personal finance software comfortably ahead of the pack. This upgrade is an incremental, but still welcome, improvement over an already excellent product. Feb 95

★★★ **StreetSmart 1.0, Charles Schwab & Company, 800/334-4455, \$59.** If Schwab is where you want your investments held, and if you want to have tighter control over your portfolio and save on brokerage fees, you should seriously consider this financial investment software. Feb 95

GRAPHICS

★★★★ **Adobe Dimensions 2.0, Adobe Systems, 415/961-4400, \$199.** 3-D effects software has added color support, as well as drawing and text tools. Its ability to create resolution-independent 3-D images and map two-dimensional art earn Dimensions a place on a designer's hard drive. Apr 95

★★★★ **Adobe Illustrator 5.5, Adobe Systems, 415/961-4400, \$595.** Despite slight speed disappointments, this draw program's upgrade is a bargain. It includes more than 200 tile patterns, 220 fonts, and the Acrobat Distiller and Exchange utilities. Sep 94

★★★★ **Adobe Photoshop 3.0, Adobe Systems, 415/961-4400, \$895.** Image-editing program both broadens its capabilities and simplifies its work environment in this dynamic upgrade. While not perfect, the pros far outweigh the cons. Jan 95

★★ **Art Explorer 1.0, Aldus Consumer Division, 619/558-6000, \$49.95.** While its cartoon style is refreshing and its features promising, this paint/draw program for kids 8 to 12 years old is still rough around the edges. Its biggest limitation is that it's unusably slow on 68030 Macs. Feb 95

★★★★ **Blueprint 5.0, Graphsoft, 410/290-5114, \$295.** For plain old 2-D drafting, this CAD software has a rich, easy-to-use feature set and is admirably fast. The Power Mac version in particular is a first choice for large architectural or engineering diagrams. Jan 95

★★★ **ClarisDraw 1.0, Claris Corp., 408/727-8277, \$399.** For presentations without grand artistic pretensions, this draw program can be an effective tool. Considering the wobbliness of some of its features, however, \$400 may be too much to pay. Jan 95

★★★ **Dabbler 1.0, Fractal Design Corp., 408/688-5300, \$99.** Art-education and paint software provides an excellent paint set with an appealing if slightly quirky interface, at a great price. Nov 94

★★★★ **DeBabelizer Lite 1.0 (1.1), Equilib-**

rium Technologies, 415/332-4343, \$129. Terrific graphics utility converts graphics files from one format to another. It offers a choice selection of capabilities at a nice, slim price. Aug 94

★★★ **DesignWorkshop 1.0 (1.1), Artifice, 503/345-7421, \$895.** The accessible interface and versatile modeling environment of this 3-D modeling software may be worth the fairly high price, particularly for architectural-design conceptualization. May 94

★★★★ **ElectricImage Animation System 2.0, Electric Image, 818/577-1627, \$7495.** Although the price may seem incredibly high, this software, with its extraordinary animation and image-rendering capabilities, is worth every penny for cinematic-production professionals. Dec 94

★★★ **Flying Colors, Davidson & Associates, 310/793-0600, \$40.** While not the most dynamic kids' program, this paint/draw program provides easy-to-use tools and nicely drawn stamps for ages eight to adult. Feb 95

★★★★ **IntelliDraw 2.0, Adobe Systems, 619/558-6000, \$129.** Wonderful general-purpose graphics package works well, does a great job of automating drawing tasks, and is straightforward. Despite its breadth of features, it always feels approachable. Sep 94

★★★★★ **Kai's Power Tools 2.0a (2.1), HSC Software, 310/392-8441, \$199.** Phenomenally powerful suite of Photoshop plug-ins have an addictive quality typically associated with arcade games. There's no end to the automated effects you can generate and the artwork you can create. May 94

★★★ **Koyn Fractal Studio 2.02 (2.1), Koyn Software, 314/878-9125, \$119.95.** Software lets you generate beautiful fractals of your own design. It's a reasonable choice if you are interested in Sierpinski triangles or naturalistic forms, but it's not an all-fractals-for-all-people program. Aug 94

★★★★ **KPT Bryce 1.0, HSC Software, 805/566-6200, \$199.** For less than \$200, you get a remarkable 3-D landscape-rendering program, a CD-ROM full of images, a slide-show utility, and even some screen-saver modules. Although the innovative, graphics-heavy interface can be confusing, this software is lots of fun. Dec 94

★★★ **Live Picture 1.5.5, HSC Software, 805/566-6200, \$3995.** At its core, this image editor is a promising program rather rudely assembled atop some marvelous technology and burdened by an extremely high price tag. Though fast and blessed with all the benefits of a proxy-based system, its day-to-day functions leave plenty of room for improvement. Dec 94

★★★★ **LogoMotion 1.0, Specular International, 413/253-3100, \$149.** Easy-to-use 3-D package is eminently affordable. It's a terrific program, both for creating flying logos and as an entry-level 3-D package for nonprofessionals. Nov 94

★★★★ **MacDraft 4.0, Innovative Data Design, 510/680-6818, \$449.** Report-links to Excel and a clean interface make this 2-D CAD software an excellent choice for use in mechanical engineering and construction. Plus, it's easy to learn. Mar 95

★★★★ **MacroModel, Macromedia, 415/252-2000, \$1495.** This 3-D modeling software is a solid resource to have along when you venture out into 3-D space. The interface is elegantly simple. May 94

★★★★ **MetaFlo', The VALIS Group, 415/435-5404, \$595.** Graphics utility yields interesting visual effects with a minimum of fuss. It imparts elasticity to 2-D images, letting you push and pull collections of pixels while retaining the visual integrity of the image. Aug 94

★★★★ **MiniCad 5, Graphsoft, 410/290-5114,**

\$795. Excellent CAD software for the Power Mac offers major performance for its price. It's admirably easy to learn. Nov 94

★★★★ **Paint Alchemy 1.0, Xaos Tools, 415/487-7000, \$99.** For the price, these plug-in graphics effects are a tremendous value that both casual users and professional artists can use to design a little chaos into their work. May 94

★★★★★ **Painter 3, Fractal Design Corp., 408/688-8800, \$499.** Image-creation program has achieved a rare state of perfection, balancing enhanced conventional controls with spectacular effects packaged inside a tidy interface. It offers a new level of usability and genuine practicality. Apr 95

★★★★ **PhotoEnhancer 1.0, PictureWorks, 510/855-2001, \$129.** Nifty utility provides dozens of ways to improve the quality of QuickTake photos, from sharpening or softening focus to correcting over- or underexposed shots. Apr 95

★★★ **PhotoMatic 1.01, Day5tar Digital, 404/967-2077, \$199.** AppleScript-based utility lets you automate tasks in Adobe Photoshop 2.5.1 or later. Although it's limited, it can relieve you of some mundane chores. Nov 94

★★★★ **Pixar Typestry 2.1, Pixar, 510/236-4000, \$299.** With QuickDraw GX support, an approachable interface, a strong array of animation features, and outstanding image quality, this 3-D type-effects software is worth a try. It adds a new dimension to the way you look at type. Feb 95

★★★★ **PixelPaint Pro 3.01, Pixel Resources, 404/449-4947, \$379.** Color paint program strikes a good balance between the artistic demands of painting and the technical precision of image processing. Mar 95

★★★ **Pointillist, Pictor GraFX, 310/865-0495, \$39.95.** Stereogram software creates images that look, at first glance, like random dots, but as you focus beyond the page, a 3-D image emerges from the pattern and appears to hover inches in front of the background. It's gleefully wacky. Jul 94

★★★ **Ray Dream Designer 3.1.1, Ray Dream, 415/960-0768, \$349.** 3-D graphics program provides competent (if sometimes awkward) modeling tools, offers excellent surface-texturing capabilities, and produces high-quality ray-traced renderings. Mar 95

★★★ **5canPrepPro 1.2, ImageXpress, 404/564-9924, \$695.** Adobe Photoshop add-on automates the scanning and image-messaging process and produces good results, although the program is somewhat unstable. Nov 94

★★★★ **Scenery Animator 1.0.4 (1.1), Natural Graphics, 916/624-1436, \$149.** Landscape rendering and animation software uses U.S. Geographical Survey data to create remarkably realistic 3-D representations of terrain. Its flaws are few, and our reviewer recommends it. Aug 94

★★★ **Specular Collage 2.0.1, Specular International, 413/253-3100, \$399.** Practical image-compositing solution supplies a smooth interface and strong support for Adobe Photoshop 3.0. As long as you're willing to return to Photoshop to confirm your edits and make final changes, it's a serviceable tool. Feb 95

★★★ **Terrazzo 1.0, Xaos Tools, 415/487-7000, \$199.** Turning a random group of pixels into a geometric pattern may not be everyone's consuming passion, but this plug-in graphic-effects module has definite appeal for a select niche of fabric, graphic, and video designers. Nov 94

continues

Star Ratings

★★★★ **TextureScape 1.5, Specular International, 413/253-3100, \$195.** Algorithmic art program lets you manipulate and arrange PostScript shapes to create seamlessly repeating patterns. Like the best tools, it's simple enough to be fun and flexible enough to give you meaningful control. Feb 95

★★★★ **Typetry 2.0 (2.1), Pixar, 510/236-4000, \$299.** An approachable interface, animation support, and outstanding Renderman rendering technology make this 3-D type-renderer a popular choice. This version improves on the original, but still lacks canned positioning effects. Jun 94

★★★★ **TypeTwister 1.0, Adobe Systems, 415/961-4400, \$29.95.** Inexpensive, easy-to-use, and fun type styler lets you create wildly styled text effects, although it won't satisfy hard-core type manipulators. Jan 95

★★★★ **Virtus WalkThrough Pro 2.0, Virtus Corp., 919/467-9700, \$495.** Aside from occasional stumbles, this design tool is an exceptional program that lets you quickly and intuitively interact with your designs and gives clients the opportunity to visit and explore your creations before they are built. Apr 95

★★★★ **Vistapro 3.0, Virtual Reality Laboratories, 805/545-8515, \$149.95.** 3-D landscape rendering software uses digital versions of U. S. Geological Survey maps to create images and allows you to add external features such as buildings and rivers. Although it's a good program, it has some limitations. Feb 95

MATH/SCIENCE

★★★★ **Chamber Works 1.0.2 (1.1), OnScreen Science, 617/776-6416, \$99.** Simulator for particle-physics events is the best introduction to particle physics yet produced, at a great price. Dec 94

★★★★ **JMP 3.0, SAS Institute, 919/677-8000, \$695.** This statistics software can be used for a wide range of biological, chemical, and physical-science investigations. New features include floating tool palettes, an annotation tool for data tables, and an experimental-design module. Sep 94

★★★★ **Kekulé 1.1, PSI International, 410/821-5980, \$495.** Science software reads scanned chemical-structure drawings and interprets them, giving both a diagram for checking interpretation accuracy and a formal string representation of the structure. Nov 94

★★★★ **LabView for Mac 3.0.1, National Instruments, 512/338-9119, \$1995.** For large-scale, demanding projects in data acquisition and analysis, this scientific software is an unchallenged standard. Jul 94

★★★★ **Maple V 3.0, Waterloo Maple Software, 519/747-2373, \$795.** If you prefer to do your own programming and function creation, you'll benefit from this symbolic mathematics software's efficient use of your Mac's resources. This version hits most of the points on your symbolic-math wish list. Oct 94

★★★★ **MATLAB 4.1, The Math Works, 508/653-1415, \$1695.** Relatively expensive numerical math software has added nearly 100 new graphics commands, improved its treatment of sparse matrices, and added commands for sound processing. Its toolboxes make it a first choice for many applied-science specialties. Nov 94

★★★★ **MLab, Civilized Software, 301/652-4714, \$1495.** Mathematical-modeling software lets you do fast computation on numerically complex real-world problems, using an ancient Mac II or higher. You must be willing to write short programs, but professional researchers will find it a rewarding choice. Apr 95

★★★★ **Resampling Stats 1.0, Resampling**

Stats, Inc., 703/522-2713, \$225. Innovative statistics software has proved itself to be a superior teaching tool in numerous classroom tests. If you have any interest in statistics, you should give this admirably straightforward approach careful consideration. Jun 94

★★★★ **SerePlot 2.12, Scientific Visions, 301/593-0317, \$135.** If you have piles of data and don't need animated, exploding bar-charts in 24-bit color, this scriptable plotting software should be part of your analysis tool kit. Jun 94

★★★★ **Spyglass Plot 1.0, Spyglass, 217/355-6000, \$295.** This scientific-charting software is the first choice for serious large-set plot crunching. Oct 94

★★★★ **Statistica/Mac 4.1, StatSoft, 918/583-4149, \$695.** At present, this statistical software is the undisputed features-per-dollar champion in the Mac market. Mar 95

★★★★ **SuperScope II 1.25, GW Instruments, 617/625-4096, \$1490.** Despite a relatively small instrument library, this laboratory data-acquisition software effectively covers a wide range of needs, and learning to use it won't become your life's work. Oct 94

★★★★ **Survival Tools 1.0, Abacus Concepts, 510/540-1949, \$295.** The combination of survival analysis with the StatView template systems gives you a virtual actuary-in-a-box. It's a great set of tools, conveniently packaged. Feb 95

ORGANIZATION/PRODUCTIVITY

★★★★ **ACT 2.0, Symantec Corp., 503/334-6054, \$249.95.** Contact manager's file-level compatibility with DOS and Windows and its complete contact management make it worth considering if you can live with its weak scheduling functions. Mar 95

★★★★ **Arrange 2.0, Common Knowledge, 415/325-9900, \$349.** If your needs fall beyond the usual calendar and address-book functions, this personal information manager is a strong contender. It now has more calendar functions and print options. Dec 94

★★★★ **Claris Organizer, Claris Corp., 408/727-8227, \$99.** New personal information manager users, lured by the low price, good performance, and ease of use of this product, will find that it meets their needs. Most longtime PIM users won't be tempted to switch. Jan 95

★★★★ **DateBook & TouchBase Pro Bundle 4.0, Adobe Systems, 619/558-6000, \$89.99.** Personal information manager package is now easier to use and offers many new features. The excellent linking between contacts and calendar is the most significant feature. Sep 94

★★★★ **DateView 1.0.1 (1.0.2), Advanced Software, 515/225-4163, \$99.95.** If you're willing to sacrifice some features to get simplicity and speed, this calendar/to-do manager makes sense. It integrates with the contact manager, InTouch. Aug 94

★★★★ **Dynodex for Macintosh 3.5, Portfolio Software, 802/434-6400, \$69.95.** Although this program doesn't currently link to a calendar, it is an excellent contact manager. This upgrade has a few new features, improved performance, and an easier-to-use interface. Sep 94

★★★★ **Expresso 1.0, Berkeley Systems, 510/540-5535, \$69.99.** The just-the-basics approach of this calendar and address book might be just fine for people who don't need the feature set of other calendar programs and enjoy its graphics. Apr 95

★★★★ **FastPace Instant Contact 1.0, Foresight Technology, 817/731-4444, \$79.99.** Although this

contact manager could use a few additional features—especially a menu-bar search function—it does a capable job, and it is intuitive and easy to use. Jan 95

★★★★ **First Things First Proactive 1.1, Visionary Software, 503/246-6200, \$149.** Capable scheduling program has some convenient features. It's worth a look if you don't have to share information with a contact manager. Nov 94

★★★★ **Full Contact 2.01 (2.02), FIT Software, 408/562-5990, \$169.** Personal information manager can handle with speed and style tasks that would choke other products, but frequently, using it feels like a full-time job. Aug 94

★★★★ **In Control 3.0.4, Attain Corp., 617/776-1110, \$85.** Excellent to-do-list manager and outliner, coupled with a good calendar is a strong choice if you live and die by to-do lists. Oct 94

★★★★ **Now Contact and Now Up-to-Date 3.0, Now Software, 503/274-2800, \$99.** Taken together, this contact manager and calendar provide a set of solid, reliable tools for keeping your life in order. Users who need to share information over a network may find it close to ideal. Apr 95

★★ **Souvenir 2.2, ComposeTel, 415/327-0744, \$49.** While this contact manager is fast and simple, it's hard to recommend it when you can buy integrated contact managers and schedulers for about the same price. Dec 94

★★★★ **TimeSquare 1.0, Team Building Technologies, 514/278-3010, \$149.** Fast, flexible, network calendar program has lots of handy features, but it's missing a few as well, such as multiday events and label grouping. Aug 94

PRESENTATION TOOLS

★★★★ **Adobe Premiere 4.0, Adobe Systems, 415/961-4400, \$795.** Video-editing software for the Power Mac remains as solid and reliable as previous versions, and also advances far and above its competitors with new and improved professional-level features. With the right hardware, it can give desktop-video editors broadcast-quality products with a minimum of compromises. Dec 94

★★★★ **Amazing Animation, Claris Corp., 408/727-8277, \$59.** Cute pictures, funny sounds, and a kid-friendly interface come together in this package that lets children produce short animations or interactive presentations. The canned animations and scenes grow tiresome, however. Jan 95

★★ **Animation Master 2.0.5, Hash Enterprises, 206/750-0042, \$699.** Although this animation software packs extraordinary power at a reasonable price, it's difficult to learn and prone to instability. Oct 94

★★★★ **Deck II 2.1, OSC, 415/252-0460, \$399.** AV Macs turn into digital-audio workstations with this software that enables you to record, mix, modify, and play back CD-quality sound. Jun 94

★★★★ **FlipBook 1.0, S. H. Pierce, 617/338-2222, \$89.** Animation printing utility lets users make flip-books out of QuickTime movies, PICS animations, and Scrapbook files. Jun 94

★★★★ **HyperCard 2.2, Apple Computer, 408/996-1010, \$249.** Authoring tool strikes a good balance between power and ease of use, and its price is reasonable. It may not satisfy all your wishes, but it should keep you happily building stacks. Sep 94

★★★★ **Macromedia Director 4.0, Macromedia, 415/252-2000, \$1195.** Although this multimedia program remains far from easy to use, this ad-

mirable upgrade increases the program's power and improves its interface. Multimedia professionals will continue to find it the best package available. **Sep 94**

★★★ **Microsoft PowerPoint 4.0, Microsoft Corp., 206/882-8080, \$399.** If you're in the market for a presentation-graphics program, this is a good choice to use along with Word or Excel, as long as you don't mind the lack of animation functions. For general purposes, though, other alternatives have the edge. **Feb 95**

★★ **MovieWorks 2.0.2, Interactive Solutions, 415/377-0136, \$295.** With diligence you can get decent results with this all-in-one QuickTime-based multimedia package. But other entry-level programs make leaping into multimedia easier and more rewarding. **Sep 94**

★★ **mPower 2.0, Multimedia Design Corp., 704/523-9493, \$295.** Despite a handful of sophisticated multimedia features, this authoring tool is too limited to be compelling. While its push-button interface is easy to understand, it's far too cumbersome. **Apr 95**

★★★ **The Multimedia Workshop 1.0, Davidson & Associates, 310/793-0600, \$79.95.** Children or adults can use this media-integration tool without big investments of either time or money. It's full of compromises, though, such as the inability to layer narration over music. **Nov 94**

★★★★ **Persuasion 3.0, Adobe Systems, 206/622-5500, \$339.** Users have plenty of new features to cheer about, including improved tool palettes, extensive charting options, and hypertext functions with this presentation graphics program's upgrade. High memory and disk-space requirements are drawbacks. **Sep 94** ➔

★★★★ **SoundEdit 16, Macromedia, 415/252-2000, \$379.** Digital audio software supports 16-bit sound and has enough goodies to earn it a place in a multimedia producer's toolbox. But its lack of record-level controls limits its usefulness as a professional audio tool. **Dec 94**

★★ **Special Delivery 2.0, Interactive Media Corp., 415/948-0745, \$399.** Multimedia authoring tool can be confusing and isn't the best choice for complex projects. Still, it may save hours of training for users who merely need to create simple presentations. **Apr 95**

★★★★ **SuperCard 1.7.1, Allegiant Technologies, 619/587-0500, \$495.** Multimedia authoring system adds a few welcome enhancements and squashes some old bugs. For current users, the upgrade is well worth the price; for others, it's an excellent alternative to more expensive authoring systems. **Feb 95**

PROGRAMMING

★★★★ **IDL 3.5, Research Systems, 303/786-9900, \$1500.** In this shockingly powerful, compact, graphics-oriented, interpreted language, a single command is worth a page of C-language code. **Oct 94**

★★ **ScriptWizard 1.0, Full Moon Software, 408/253-7199, \$99.** Software attempts to make writing and debugging AppleScript scripts easier but doesn't offer enough improvement over Apple's Script Editor. **Jan 95**

★★★ **VIP BASIC 1.0.1 (1.0.3), Mainstay, 805/484-9400, \$295.** Popular programming language lets programmers who know only BASIC get started producing real, if interpreted, Mac programs. **Jun 94** ➔

★★★★ **VIP-C 1.5 (1.5.1), Mainstay, 805/484-9400, \$495.** For convenience in producing 680X0/Power Macintosh applications, this programming utility is a fine investment. Intermediate to advanced users will get the most benefit, but even beginners will find that it helps turn student projects into serious apps. **Feb 95** ➔

UTILITIES

★★ **Apple Personal Diagnostics 1.0 (1.1), Apple Computer, 408/996-1010, \$129.** In trying to make a hardware tool for the rest of us, Apple has come up short. This hardware-diagnostics utility has an uneven manual, some less than thorough tests, and a surprisingly unsatisfying interface. **Nov 94** ➔

★★★ **AppleSearch 1.0, Apple Computer, 408/996-1010, \$1799.** Although it has some rough edges, this product for archiving and retrieving text is highly useful. It presents retrieved information clearly and extracts text from documents in many formats. **May 94**

★★★ **Atticus Vista 1.0 (1.0.2), Atticus Software Corp., 203/348-6100, \$69.95.** Control panel and application automatically catalog the disks you mount on the desktop. It has a few problems, including limited search options, but it can help bring order to disorganized disk collections. **May 94**

★★★★ **Automap Road Atlas for Macintosh 2.01 (2.04), Automap, 206/455-3552, \$99.95.** Mapping software tells you how to get where you're going. Although screen redraw is slow, it's worth it for the written directions and maps. **Jul 94**

★★★★ **Cal 1.0, Thought I Could, 212/673-9724, \$79.95.** Well-chosen set of desktop necessities includes an excellent calculator, an associated-formula editor, a datebook, and a calendar. Due to its easy access and ample power, this software has become an everyday tool for our reviewer. **Jan 95**

★★★ **CD AllCache 2.0, CharisMac Engineering, 916/885-4420, \$79.95.** CD-ROM accelerator improves access time by caching a CD's directory and putting its most frequently used data into RAM. Despite this software's limitations, most CD addicts will find the speed improvement worth the trouble. **Sep 94**

★★★★ **CD-ROM ToolKit 1.0.5 (1.1), FWB, 415/474-8055, \$79.** Software accelerator can halve the time it takes to open files on a CD-ROM. **May 94** ➔

★★★★★ **Conflict Catcher II 2.1.1, Casady & Greene, 408/484-9228, \$79.95.** Customizable, fast, and safe extension-management utility goes well beyond the basics. For Power Macintosh users, it even tells which extensions aren't written in native code and are likely to slow down Power Macs. **Oct 94** ➔

★★★★ **DiskGuard 1.0.1 and DiskGuard Remote, ASD Software, 909/624-2594, \$129 to \$799.** Rock-solid, flexible disk-protection tools are worth serious consideration if your Mac or Macs are accessible to others. The remote version (in five- and ten-user packs) adds network features, including clock synchronization. **Mar 95**

★★★★ **DiskTop 4.5 (4.5.1), PrairieSoft, 515/225-3720, \$99.95.** Organizing a crammed hard drive is a more manageable task with this simple but powerful file-management utility that lets you copy, move, rename, delete, and find files—without using the Finder. **Jul 94** ➔

★★★★ **Drive7 3.0, Casa Blanca Works, 415/461-2227, \$79.95.** Highly recommended hard drive-formatting utility easily formats and partitions most drives and provides all the options you need. And within its limitations, its Mount Cache utility provides a real performance boost. **Nov 94**

★★★ **eDisk 2.0, Alysis Software Corp., 415/928-2895, \$149.95.** Driver-level software compresses data read to your drive on the fly and automatically expands data read from your drive. It offers transparent compression. **Dec 94**

★★★★ **Icon Mania 1.0 (1.01), Dubl-Click Software, 503/317-0355, \$69.95.** Delightful icon-

editing utility comes with terrific tools for building new icons, including an outstanding thumbnail feature that builds custom icons from graphics files. **Aug 94**

★★★★ **Kaboom 3.0, Nova Development Corp., 818/591-9600, \$49.95.** Sound-effects utility with sound-editing application is a fun program for anyone who wants to play with sound. **Feb 95**

★★★★ **Launch Pad 1.0, Berkeley Systems, 510/540-5535, \$49.99.** If you want to share your Mac with your kids, this desktop utility is a worthwhile investment. It can even speak menu items and file names out loud for kids too young to read. **Jan 95**

★★★★ **Maxima 3.0, Connectix, 415/571-5100, \$99.** If you have more than 8MB of RAM, you can use some of it as a RAM disk, speeding up disk-based operations, with this inexpensive utility. **Nov 94**

★★★★ **MultiClip Pro 3.1, Olduvai Corp., 305/670-1112, \$59.** Easy-to-use utility is exactly what Apple's Clipboard and Scrapbook should have been; a convenient repository of data that moves between documents without fuss or muss. **Apr 95**

★★★★ **Norton DiskDoublerPro 1.1, Symantec Corp., 503/334-6054, \$109.** Utility collection includes DiskDoubler, AutoDoubler, and CopyDoubler. Because of its ease of use, the product is a good choice for beginners. **Feb 95** ➔

★★★ **Norton Utilities for Macintosh 3.1, Symantec Corp., 503/334-6054, \$149.95.** Data-protection and -recovery utility collection is leaner, meaner, and faster than ever before, but it's also surprisingly uneven. While Disk Doctor leads the pack for disk-repair utilities, the back-up module is weak and the new UnErase module is missing some features. **Feb 95**

★★★★ **Now Utilities 5.0, Now Software, 503/274-2800, \$89.** Three of the modules of this fine-tuned, interlocking utility set—Now FolderMenus, Now Menus, and Now SuperBoomerang—are almost indispensable, and while the other six may not be tops in their category, they're well worth considering. As a collection, this package remains the best in the business, and it's Power Mac native. **Jan 95** ➔

★★★ **Open Sesame 1.02 (1.1), Charles River Analytics, 617/491-3474, \$99.** Utility automates Finder operations, such as opening, without macros or scripts. It has an elegant interface, but people with strict work habits are more likely to find its suggestions worthwhile than are those who don't follow a routine. **May 94** ➔

★★★ **PaperPower 1.0, Piptel, 513/294-6656, \$149.** Graphics-tablet utility provides a useful tool for creating and using macros, but the overlays it creates can be tricky to use. **Apr 95**

★★★ **Peirce Print Tools 1.0, Peirce Software, 408/244-6554, \$129.** Nine handy printing utilities work with QuickDraw GX. Most of the modules are useful, but not all are must-haves. **Jan 95**

★★★ **PopupFolder 1.0 (1.5), Inline Software, 617/935-1515, \$59.95.** Finder utility is so handy and easy to use, you wonder why it isn't built into the Mac's system software. On the other hand, it's sluggish when readying pop-up menus for every folder. **Aug 94**

★★★★ **PowerAgent 1.1, SouthBeach Software Corp., 305/858-8416, \$159.** You can revolutionize your Macintosh work with this agent program that manages scripts. It provides excellent support for File-Maker Pro. **Nov 94**

★★★★ **PowerMerge 2.0, Leader Technologies, 714/757-1787, \$129.** Powerful file-management tool helps you keep individual files, folders, or entire volumes organized and up-to-date. This version lets you *continues*

Star Ratings

compare and launch documents, rename files, trash superfluous files, and lots more. **Aug 94**

★★★ **ProFiles 1.0, Dayna Communications, 801/269-7200, \$129.** Unusual new utility lets you group related files and folders for quick access and actions such as making aliases, copying, and more. **Aug 94**

★★★★ **RAM Doubler 1.0.1 (1.5), Connectix Corp., 415/571-5100, \$99.** Inexpensive system extension doubles available RAM for many Mac users. There are a number of requirements, however, including System 7, 4MB of physical RAM, and a 68030 board. **May 94** 📌

★★★ **RescueTxt 1.0, Abbott Systems, 914/747-3116, \$79.** If you want decent performance and the ability to locate text in even a deleted file, this text-retrieval utility is a good choice. It doesn't tell you what file the text comes from, however, so you cannot simply open the found file. **Apr 95** 📌

★★ **SCSI Director Pro 3.0.6, Transoft Corp., 805/565-5200, \$99.** Utility provides simple, one-button hard disk formatting. Technical support costs \$1.90 per minute. **Sep 94**

★★★★ **Square One 2.0, Binary Software, 310/449-1481, \$74.** The slick design, flexibility, and straightforward interface of this file-launching utility make it a pleasure to use. **Dec 94**

★★★ **Stop & Go 4.0, Engram International, 415/455-1100, \$69.99.** File-protection/relaunch utility uses a portion of your hard disk to save a snapshot of the data in your Mac's RAM. It's fast but unduly complicated. **Oct 94**

★★★★ **UnderWare 1.0.1, Bit Jugglers, 415/968-3908, \$59.95.** Inspired, silly fun for your Mac's desktop comes from a control panel that adds three features: a screen saver, desktop patterns, and animations that run on your desktop while you work. The price for this whimsy is mostly in disk space. **Jun 94**

★★★★ **VirtualDisk 1.1a (2.0), Continuum Software, 206/695-8136, \$79.** Rapid disk cataloging; fast, efficient label-printing; and an excellent disk-copy utility make this software a wonderful value. **Jul 94**

★★★ **Wiz Tools for PowerBook 1.2.2, ASD Software, 909/624-2594, \$79.95.** The connectivity, file-synchronizing, and security features of this collection of PowerBook utilities are appealing, but the rest of the modules are also rans. **Jan 95**

VERTICAL MARKETS

★★★ **Autoscore 1.0, Wildcat Canyon Software, 510/527-5155, \$150.** Converting the human voice into MIDI note information is a challenging task. If you have the right music software, mike, and voice, this music-recognition software can actually pull it off. **Feb 95**

★★★ **Bird Brain 2.01, Ideaform, 515/472-7256, \$125.** Database lets bird watchers record every sighting of every bird they have ever seen to create electronic life lists. Although it can be slow, it includes species names and other information. **Jan 95**

★★★★ **Claire, The Personal Music Coach 1.0.1, Opcode Systems, 415/856-3333, \$129.95.** Musicianship program teaches pitch and interval recognition, sight singing, and intonation. The interface is nonstandard, but it's logical and easy to learn. **May 94**

★★★ **DigiTrax 1.1, Alaska Software, 408/738-3320, \$349.** If you're an amateur musician or a multimedia producer with modest sound-recording needs and you have a Quadra AV, consider this audio-recording software. What it lacks in features, it makes up for in simplicity and a rela-

tively low price tag. **Mar 95**

★★★ **ErgoKnowledge 1.0, Visionary Software, 503/246-6200, \$395.** Despite a few shortcomings, this CD-ROM offers a good, basic review of office-computer ergonomics. **Dec 94**

★★★ **MayaCalc 2.3.1, Ecological Linguistics, 202/546-5862, \$120.** 4th Dimension database alleviates much of the pain involved in working with the complex, multilayered Maya calendar. Although the design could be improved, it's a highly useful tool for both serious and casual Maya enthusiasts. **Feb 95**

★★★★ **Maya Hieroglyphic Fonts, Ecological Linguistics, 202/546-5862, \$10 to \$60 per set.** Although these fonts based on Mesoamerican hieroglyphic scripts are beautifully rendered, the character spacing is sometimes uneven. **Feb 95**

★★★★ **Mayo Clinic Family Health Book 1.2, IVI Publishing, 612/686-0779, \$69.95.** Medical CD-ROM for home use deals with the full gamut of health-care topics, from AIDS to zygotes, although it doesn't include any reference to alternative therapies. **Sep 94**

★★★ **Mayo Clinic: The Total Heart 1.0, IVI Publishing, 612/686-0779, \$59.95.** Cardiovascular health and related subjects are the topics of this medical CD-ROM for home use. Although it makes liberal use of drawings, photographs, and animations, video sequences would have been more effective. **Sep 94**

★★★ **Medical HouseCall 1.0, Applied Medical Informatics, 801/464-6200, \$99.95.** Interactive medical guide is a painless way for people to learn about diseases, tests, and therapies. Although it's easy to use and interesting, some images were incorrectly labeled. **Feb 95**

★★★ **MusicTime 2.0, Passport Designs, 415/726-0280, \$149 to \$249.** Music-notation program is geared for hobbyists and students. If your needs aren't complex, it may fit the bill, at a great price. **Oct 94**

★★★★ **Overture 1.02, Opcode Systems, 415/856-3333, \$495.** Easy-to-learn, midrange notation software has a friendly interface and shows real polish. If you don't need all the features of a high-end product, it's a serious contender. **Apr 95**

★★★ **Performer 5.02, Mark of the Unicorn, 617/576-2760, \$495.** A colorful, redesigned interface and improved sheet-music view are part of this MIDI recording program's worthwhile overhaul. If you like the sheet-music view, this is the product to buy. **Mar 95**

★★★★ **Practica Musica 3.0, Ars Nova Software, 206/889-0927, \$140.** Music-teaching program, with emphasis on sight-reading and ear-training techniques, shines as a smart, infinitely patient personal music coach in the classroom. **Jan 95**

★★★ **5AM-CD, Scientific American Medicine, 212/754-0550, \$395.** Despite a few shortcomings, such as the poor interface for case simulations, this medical reference work should prove a worthwhile addition to any medical library. **Sep 94**

★★★ **Vision 2.08, Opcode Systems, 415/856-3333, \$495.** MIDI program's list of exclusive, creativity-slanted features, such as endless count off and scrubbing (which lets you hear the music as you drag across it), give the program a usability edge. **Mar 95**

★★★★ **WillMaker 5.0, Nolo Press, 510/549-1976, \$69.95.** Legal software quickly and easily automates the creation of wills, health-care directives and proxies, and final-arrangements documents. **Jun 94**

WRITING TOOLS

★★★★ **Bookends Pro 3.1, Westing Software,**

415/435-9343, \$129. Comprehensive database program catalogs and stores all of your reference material—actual quotes as well as citations. It's a useful tool that researchers will appreciate. **Mar 95**

★★★★ **EndNote Plus 2.0, Niles & Associates, 510/649-8176, \$299.** Despite its power, this indispensable bibliography and citation manager is surprisingly easy to learn and use. If you have to work with references, it's a good choice. **Apr 95**

★★★ **FullWrite 2.01, Akimbo Systems, 617/776-5500, \$395.** As the leanest of all high-end word processors, this product requires only 2MB of RAM. Although its modular architecture is complex, it's worth considering if you don't need to share files with the Word/WordPerfect crew. **Apr 95**

★★★ **Grammatik 6 for Macintosh, WordPerfect Corp., 801/225-5000, \$49.95.** The low price, pleasant interface, and improved accuracy of this grammar checker make it worthwhile for a large number of quality-driven writers. It still misses some errors. **Feb 95**

★★★ **Inspiration 4.1, Inspiration Software, 503/245-9011, \$195.** Writing tool allows you to move between words and diagrams to show the relationships between ideas. This version adds improved keyboard controls, import and export capability, plus more. **Apr 95** 📌

★★★★ **MacWrite Pro 1.5 (1.5 v2), Claris Corp., 408/727-8227, \$249.** The clean, uncluttered interface of this low- to middle-level word processor is still one of its major assets. This upgrade adds support for QuickTime, PowerTalk, AppleScript, and more. **May 94** 📌

★★★ **Microsoft Word 6.0, Microsoft Corp., 206/882-8080, \$329.** If you can put this word processor's new features—including cross-referencing, AutoText, automatic numbering, macros and more—to work and you have a Quadra 650 or faster Mac, take the plunge. If you have a slower 68040 Mac, think twice; and if you have a 68030 Mac, don't even think about it. **Feb 95**

★★★ **Nisus Writer 4.0, Nisus Software, 619/481-1477, \$495.** In a few specialized areas—such as mixing English and non-Romance languages, this word processing program is unmatched. However, for some high-end uses, such as table creation, it's a poor choice. **Mar 95**

★★★★ **OmniPage Professional 5.0, Caere Corp., 408/395-7000, \$695.** In a historic first for OCR, this Power Mac software has an accuracy of 100 percent on good text samples. It does still make occasional baffling minor errors on real-world documents. **Nov 94** 📌

★★★ **Random House Unabridged Dictionary, Random House Electronic Publishing, 212/572-2600, \$179.** Comprehensive dictionary on CD-ROM works within any program and is good at guessing misspelled words. Although some functions don't work reliably, the quality and design of the software are better than those of other dictionaries on CD-ROM. **May 94**

★★ **Read-It O.C.R. Pro 5.0, Olduvai Corp., 305/670-1112, \$395.** Although this OCR software has a nice collection of features, its recognition engine isn't up to par. It's not a first choice unless you simply need to process piles of very clear Courier text. **Apr 95**

★★★ **TextBridge 2.0, Xerox Imaging Systems, 508/977-2000, \$99.** Optical character recognition software is impressive on good documents and can be trained and automated. You won't find that anywhere else at this price. **Sep 94** 📌

★★★★ **WriteNow 4.0.1, Word5tar International, 617/494-1200, \$119.95.** Tidy word processor's conservative use of memory (the application fits into a dainty 600K partition) and graceful interface will *continues*

tinue to win it fans. Jun 94

★★★ **Writing Coach 1.0, WritePlace Software, 503/484-6380, \$89.** If you'd like help with your writing, this writing-skills tutorial could be a great investment. Skillfully worded worksheets assist with planning, organizing, and revising. Dec 94

Hardware

INPUT DEVICES

★★★★ **ArtPad, Wacom Technology, 206/750-8882, \$199.** Measuring less than 7 by 7½ inches, this pressure-sensitive tablet is sheer convenience if you're looking for a device that you can hide away one moment and readily exhumate the next. Apr 95

★★★ **DrawingSlate, CalComp Digitizer Division, 714/821-2000, \$395.** Digitizing tablet is a good, compact, low-cost implementation of pressure sensitivity, although the battery-operated stylus is a bit heavy. Jun 94

★★★ **Ear Phone Streamline AV, Jabra Corp., 619/622-0764, \$169.** As a hands-free telephony tool—and as a replacement for the Apple PlainTalk microphone—this telephone/speech-recognition earpiece is a winner. Jul 94

★★★★ **FlightStick Pro for Macintosh, CH Products, 619/598-2518, \$129.95.** The authentic look and feel of this joystick, along with well-conceived software, make it a nearly perfect desktop pilot's companion. Dec 94

★★★★ **Mac Keyboard Deluxe, MicroSpeed, 510/490-1403, \$125.** If you're in the market for a new or replacement keyboard, this one, which is both smaller and lighter than Apple's Extended Keyboard, is worth considering. It has four ADB ports. Nov 94

★★★★ **Mouse Deluxe Mac, MicroSpeed, 510/490-1403, \$69.** The extra buttons of this mouse offer several features that Apple's mouse doesn't match, but its shape may not suit everyone's taste. Mar 95

★★★ **Remote Point, InterLink Electronics, 805/484-1331, \$199.** Although it may not be a first choice for desktop work, this infrared pointing device is an elegant workaround for users who don't want to (or can't) be tethered to their Macs. Apr 95

★★★ **Wacom UD-1212R, Wacom Technology Corp., 206/750-8882, \$749.** Graphics tablet with pressure-sensitive stylus is easy to use and highly customizable, though it's incompatible with AppleTalk and AppleTalk Remote. May 94

MISCELLANEOUS HARDWARE

★★★★ **AirNote 1.0, Notable Technologies, 510/208-4400, \$349.** Remote-messaging service lets you originate alphanumeric paging messages from your own computer, eliminating both dictation charges and errors in translation. It's a very handy way to get into alphanumeric paging. Dec 94

★★★ **Apple PCMCIA Expansion Module, Apple Computer, 408/996-1010, \$219.** Well-integrated, well-designed unit offers 500-series users an efficient and easy albeit expensive way to add features to their PowerBooks. If you can overlook the early-adopter prices (a big if), the PC Cards are great expansion options—lightweight, low-power, and high-performance. Mar 95

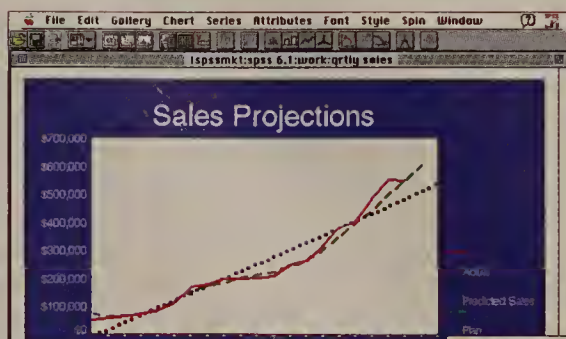
★ **EAB401P Speakers, Panasonic Communications & Systems, 800/742-8086, \$99.** Small, continues

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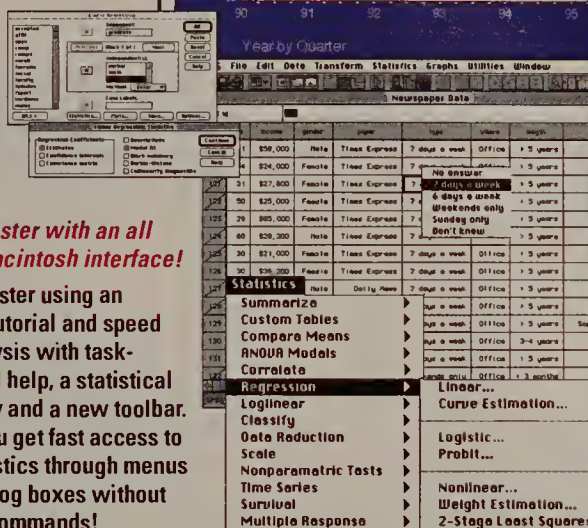
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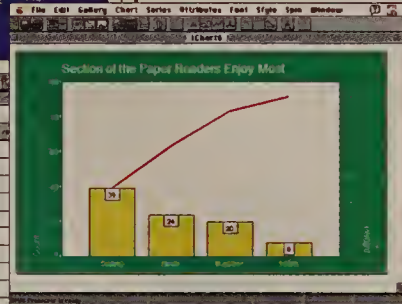
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Star Ratings

inexpensive speakers provide less-than-state-of-the-art performance. The audio is thin and reedy. **Apr 95**

★★ **EAB701P Speakers, Panasonic Communications & Systems, 800/742-8086, \$249.** The sound of these speakers is thin and slightly harsh, although they are attractive in a high-tech sort of way. **Apr 95**

★★★★ **IX-401S Color Image Scanner, Canon Computer Systems, 714/438-3000, \$1169.** The price of this color flatbed scanner is competitive, and its speed and excellent bundled software make it easy to use and a good choice for the small office. **Jul 94**

★★★★ **MMSS57, Audio-Technica USA, 216/686-2600, \$149.95.** Among a huge selection of similarly priced speaker systems, these stand out as a best buy. They look good, as well as sound good. **Apr 95**

★★★★ **MultiSpin 4Xe, NEC Technologies, 708/860-9500, \$515.** With its competitive price, free tech support, and two-year warranty, this quad-speed CD-ROM player is ready to race. **Feb 95**

★★★★ **Photo Engine, Radius, 408/541-6100, \$1099.** Photoshop acceleration hardware's suite of four 66MHz 32-bit DSP chips offers sufficient processing power to speed up 25 Photoshop functions on the most sophisticated systems, including Power Macs. **Feb 95** ☺

★★★★ **SCSI Sentry, APS Technologies, 816/483-6100, \$99.** Although the price of this terminator may seem steep, this device may well be the cure for SCSI woes. Our reviewer heartily recommends it. **Sep 94**

★★★★ **TurboDialer, Micromachines, 818/901-1700, \$69.95.** Automatic telephone dialer is a well-executed product, except for occasional computer noise that seeps into phone conversations. **Jul 94**

★★★★ **Vivace, Coda Music Technology, 612/937-9611, \$2295.** As an intelligent and endlessly patient accompanist, this music study system for wind instruments may be the best thing that's happened to learning wind literature since the metronome. **Jan 95**

MODEMS/NETWORK HARDWARE

★★ **Cooperative Adapter, Photonics Corp., 408/955-7930, \$349.** The high cost of each unit, the limitations and restrictions inherent in diffuse infrared, and the extremely low cost of traditional LocalTalk adapters and cabling make this infrared network interface an expensive niche product. **Dec 94**

★★★★ **Cypress PhonePro 1.2 (1.S), Cypress Research Corp., 408/752-2700, \$349 to \$950.** By improving its integration with FaxPro and with PowerTalk and PowerShare, this powerful telephony software has greatly extended its business scope. **May 94**

★★★ **DaynaPort Pocket SCSI/Link, Dayna Communications, 801/269-7200, \$299 to \$369.** Inexpensive, lightweight SCSI-to-Ethernet connector works with both desktop Macs and PowerBooks and can use the Mac's ADB port as a power source. **Nov 94**

★★★★★ **EtherWave, Farallon Computing, 510/814-5000, \$129.** Instead of providing only one 10BaseT twisted-pair jack, this Ethernet transceiver includes a second jack that allows you to daisy-chain to another device through an additional 10BaseT line. **May 94**

★★★ **FastSwitch 10, Grand Junction Networks, 510/252-0726, \$6250.** Switched Ethernet hub is a great solution for networks that handle large amounts of data traded peer-to-peer, but if your network consists of E-mail and a file server, you probably won't see much benefit in stepping up to switched Ethernet. **Dec 94**

★★★ **OneWorld Fax, Global Village Communication, 415/390-8200, \$999.** Easy-to-use network

fax product lets an office share fax-sending resources without dedicating a hard drive and CPU. **Aug 94**

★★★★ **Pocket EtherTalk Adapter, Xircom, 818/878-7600, \$349 to \$399.** All-in-one SCSI-to-Ethernet connector is lightweight and works with desktop Macs and PowerBooks. **Nov 94**

★★★★ **PowerPort Mercury/PB 500 Series, Global Village Communication, 415/390-8200, \$399.** Top-notch fax modem is capable of exemplary fax and data communications performance. **Nov 94**

★★★★ **Spectra-Com P192mx, Bay Connection, 408/270-8070, \$199.95.** If you must have absolute portability and AC power isn't available, this pocket data/fax modem can do the job. It's not that much smaller than a regular desktop modem, however. **Oct 94**

★★★★ **SupraFaxModem 288, Supra Corp., 503/967-2410, \$329.95.** This 28,800-bps fax modem is a very good performer, and the price of admission isn't steep. Combined with fast, stable fax software and a good terminal program, it's hard to beat. **Aug 94**

★★★★ **Watermark Message Central 2.0.2, High Tide Software, 510/704-9927, \$499.** If you're willing to put in a lot of effort, you'll find this highly sophisticated voice-mail system supremely flexible. It includes a specially modified modem with voice chip, as well as fax software and telecommunications software. **Jul 94**

PRINTERS

★★★★ **Apple Color StyleWriter 2400, Apple Computer, 408/996-1010, \$525.** Economical, Quick-Draw-based color ink-jet printer offers gorgeous color output plus fast black-and-white printing. If you don't need DOS/Windows compatibility, it's a good buy. **Apr 95**

★★ **Brother HJ-400, Brother International, 908/356-8880, \$369.** Compact, 360-dpi ink-jet printer is fairly slow and does not allow background printing. **May 94**

★★★ **HP LaserJet 4ML, Hewlett-Packard, 800/752-0900, \$1279.** Primarily for those who work in a small, mixed-platform environment, this energy-efficient laser printer offers automatic port and language switching, and is a good buy. **May 94**

★★★★ **LaserWriter 16/600 PS, Apple Computer, 408/996-1010, \$2399.** If speed is what you need, this fine printer is it. The price is reasonable. **Mar 95**

★★ **Notebook Printer II, Citizen America, 310/453-0614, \$399.** If weight and size are your biggest concerns in choosing a portable printer, this thermal-fusion printer may be a good choice. If speed is at all an issue, however, other options may be preferable. **Jun 94**

★★★★ **Personal LaserWriter 320, Apple Computer, 408/996-1010, \$959.** The small inconveniences of this 300-dpi printer are easily outweighed by its low price, good speed, and PostScript Level 2 support. **May 94**

★★★ **Phaser 140, Tektronix, 503/627-7111, \$1695.** If you're looking for a capable color printer for a small workgroup, this ink-jet is a great choice. It provides only 17 resident fonts, however. **Apr 95**

★★★★ **PowerPrint 2.S, GDT Softworks, 604/291-9121, \$149.** Ingenious hardware-software combo lets you print from your Mac to almost any PC printer. It supports over 1000 printers, ranging from aging dot matrix models to the newer color ink-jet and laser printers. **Sep 94**

★★★ **PrimeraPro, Fargo Electronics, 612/941-9470, \$1895.** The photo-realistic output of this thermal-wax and dye-sublimation printer beats that of any other printer in the price range. But with expensive

consumables and slow print time, it's best suited for routine thermal-wax use and occasional dye-sub work. **Jan 95**

★★★★ **P-Touch PC, Brother International Corp., 908/356-8880, ext. 4307, \$449.95.** Versatile label printer is easy to set up and use, and produces high-quality output. The cost per label is high, though, and the documentation is weak. **Sep 94**

★★ **QMS ColorScript Laser 1000, QMS, 205/633-4300, \$7999.** Color laser printer succeeds in combining the versatility of monochrome laser printing with attention-getting color, but if you don't need to chase rainbows right away, you might wait and see if competition drives capabilities up. **Jul 94**

★★★★ **Silentwriter 640, NEC Technologies, 508/264-8000, \$825.** With 3MB of RAM, PostScript Level 2 support, and a 6-ppm engine, this printer is a capable performer. **Jun 94**

★★★★ **Smart Label Printer Pro, Seiko Instruments, 408/922-5900, \$299.95.** If you need to print only a few labels at a time, this label printer may be an expensive but good choice. It prints very quickly, and with excellent print quality. **May 94**

SYSTEMS/STORAGE

★★★★ **Alacritty PM 6100, KS Labs, 614/374-5665, \$165.** Installing a clock booster is the quickest, easiest, and cheapest way to extract more power from Apple's entry-level Power Mac. **Oct 94** ☺

★★★★ **Brainstorm Accelerator for the Macintosh SE, Brainstorm Products, 415/988-2900, \$199.** Your SE will never be a Power Mac or even a IIsi, but if your budget won't buy a new Mac, you can't do better than this accelerator, which pushes an SE's speed to close to a Classic II's in overall performance. **Mar 95**

★★★ **Conley SR2 RAID System, Conley Corp., 212/682-0162, \$25,335.** While RAID technology is typically praised for its fault-tolerance rather than its speed, this high-performance storage system proves that you can have both. **Sep 94**

★★★★ **EtherDock, E-Machines, 408/541-6100, \$699.** Heavy-duty Duo docking option is equipped with a full set of 11 ports, including an Ethernet port. **May 94**

★★★ **Joule System, La Cie, 503/520-9000, Price varies by component.** Plug-and-play tower lets you stack drives—including hard drives, removable media, and other modules—atop a base unit, making it easy to buy extra storage or swap modules with other Joule towers. Joule drive prices are generally slightly higher than for comparable drives, however. **Feb 95**

★★★★ **LC 57S, Apple Computer, 408/996-1010, \$1699.** For students and small-business professionals who want high power and the convenience of having everything integrated into one case, this 33MHz 68040 system is an ideal choice. **Jun 94**

★★★★ **Newton MessagePad 110, Apple Computer, 408/996-1010, \$599.** This is the personal digital assistant that Apple should have shipped in August 1993, with improved handwriting recognition, including deferred and letter-by-letter recognition. It also has more memory, longer battery life, and a more efficient design. **Aug 94**

★★★★ **OrangePC Model 200 Series, Orange Micro, 714/779-2772, \$1139 to \$3237.** If your goal is to get a Mac that runs Windows as fast as a PC, you can't get there from here. If your goal is to get business-level performance for day-in, day-out use, these PC coprocessor cards are your best choice. **Aug 94** ☺

★★★★ **PLI Infinity 270 Turbo, PLI, 510/657-continues**

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2211, \$651. This 270MB SyQuest drive is fast, reliable, and a very good product. The cost of the medium is competitive with that of optical drives. **Sep 94**

★★ **PowerBook 150, Apple Computer, 408/996-1010, \$1449.** Fast, lightweight portable is minimalist in the extreme, with no video-out, ADB, Ethernet, or microphone. Unfortunately, the price is less minimalist, and most budget-conscious shoppers would be better off buying a used or discontinued model. **Dec 94**

★★★ **PowerBook 540c, Apple Computer, 408/996-1010, \$4839.** The prestige PowerBook du jour, this sleek, curvy and futuristic-looking notebook makes a good computer for both on-the-road and in-the-office use. Its nonstandard battery, memory, and Ethernet ports are not ideal features, however. **Oct 94**

★★★★ **PowerBook Duo 280c, Apple Computer, 408/996-1010, \$3759.** If you travel a lot, this notebook computer is hands down the best Mac to get. It offers close to the power of a Quadra 650 in a subnotebook. **Oct 94**

★★ **PowerBook Duo Dock II, Apple Computer, 408/996-1010, \$969.** Apple has added Ethernet to this full-featured docking station, but installing NuBus cards is still absurdly difficult. **Oct 94**

★★★★ **Power Macintosh 6100/60, Apple Computer, 408/996-1010, base model \$1819.** Given its price and performance, this Power Macintosh is hard to resist. This should be a system that will give you power to spare. **Jun 94** ☺

★★★★★ **Power Macintosh 7100/66, Apple Computer, 408/996-1010, \$2899.** Midrange Power Mac makes an outstanding workstation whose power should last for several years. The price is nothing to take lightly, but this system delivers every dollar's worth. **Aug 94** ☺

★★★★★ **Power Macintosh 8100/80, Apple Computer, 408/996-1010, \$4249.** While this system doesn't quite offer the excellent price/performance ratio of the other available Power Macs, you should consider it if you're a high-end user moving your work over to RISC-based computing. **Aug 94** ☺

★★★ **Power Macintosh 8100/110, Apple Computer, 408/996-1010, \$6379.** High-end users who have invested heavily in NuBus cards can protect their investment with this top-of-the-line Power Mac. **Mar 95** ☺

★★★ **Power Macintosh Upgrade Card, Apple Computer, 408/996-1010, \$699.** Current 33MHz 040 machines will get the best bang for the buck with this card, which is a less expensive upgrade path than a standard motherboard replacement. However, other Macs won't realize as much of a performance gain. **Oct 94** ☺

★★★★★ **Quadra 630, Apple Computer, 408/996-1010, \$1279.** Fast, inexpensive, expandable 33MHz 68040 machine may be the last 680X0-based desktop Macintosh, but it's one of the best entry-level Macs ever. **Nov 94**

★★★ **SCSI MicroDock, Newer Technology, 316/685-4904, \$175.** Tiny Duo docking station is just under 4½ ounces and barely 5 inches long. It adds only an ADB port and a SCSI port—but both are useful. **May 94**

VIDEO/DISPLAY

★★★ **Apple Macintosh Display Card 24AC, Apple Computer, 408/996-1010, \$1579.** 24-bit accelerated graphics card offers a satisfactory price/performance ratio, although it can't switch resolutions from the keyboard. **Oct 94**

★★★★ **Apple Multiple Scan 15 Display,**

Apple Computer, 408/996-1010, \$509. The tridot tube of this 15-inch monitor provides a sharp and accurate image, but reflects some glare. The built-in stereo speakers reproduce sound nicely. **Feb 95**

★★★ **Apple QuickTake 100 for Macintosh, Apple Computer, 408/996-1010, \$749.** For a medium-quality, digital color camera, this is the best deal around. But you may want to wait until some of the camera's problems, such as its fixed-focus lens, are ironed out. **Jul 94** ☺

★★★★ **FlexCam, VideoLabs, 612/988-0055, \$595.** Small, unobtrusive desktop video camera has a flexible gooseneck for positioning. **Dec 94**

★★★ **L-TV Portable, Focus Enhancements, 617/938-8088, \$299.** Sturdy, inexpensive, external TV-converter plugs into your Mac and converts video output to NTSC. **Aug 94**

★★★ **L-TV Pro NuBus, Focus Enhancements, 617/938-8088, \$399.99.** NuBus card converts your Mac's RGB video signal to NTSC so you can use your Mac with a TV or VCR. It supports a wide range of Macs, but the image has some flicker and distortion. **Aug 94**

★★★★ **Multiscan 15sf, Sony Computer Peripheral Products, 408/432-1090, \$569.95.** Trinitron monitor has a flat screen that displays sharp, bright, and accurate images. With good antiglare coating and adjustable image tilt, it's worth looking at. **Feb 95**

★★★★ **MultiSync 3V Monitor, NEC Technologies, 708/860-9500, \$495.** With a bright display and great image quality, this monitor delivers a fine picture at a moderate price. **Feb 95**

★★★★ **Panelight ZX, Panelight Display Systems, 415/772-5800, \$3995 to \$4695.** LCD panel offers vivid images at a comparatively low price. It's a great choice for presenters. **Mar 95**

★★★ **The Presenter Plus Mac/PC, Consumer Technology Northwest, 503/643-1662, \$429.** Small, external TV-converter supports output to television from most Macs with built-in video. **Aug 94**

★★★ **QA-350 LCD, Sharp Electronics Corp., 800/237-4277, \$2495.** At less than half the cost of a typical active matrix LCD panel, this passive matrix projection panel offers an economical alternative. **Jul 94**

★★★★ **QuickCam, Connectix Corp., 415/571-5100, \$149.95.** For as little as \$99 (street price), this tiny, fun, easy-to-use, digital video camera lets users experiment with video input for making QuickTime movies or capturing still images. **Mar 95**

★★★★ **Radius LeMansGT, Radius, 408/434-1010, \$2499.** Fast, 24-bit accelerated graphics card has automatic 30-bit CLUT calibration and can switch resolution on the fly via a pop-up menu. **Oct 94**

★★ **RasterOps Horizon 24, RasterOps, 408/562-4200, \$1999.** This 13-inch 24-bit accelerated graphics card is slower than anticipated and overpriced. The ROM can, however, be upgraded via software. **Oct 94**

★★★ **Simply TV, E-Machines, 408/541-6100, \$439.** Easy-to-install video card plugs snugly into a PDS slot, and allows you to use your Mac with a television for display. **Aug 94**

★★★★ **SuperMac Spectrum Power•1152, SuperMac, 408/541-6100, \$1399.** Fast, relatively inexpensive, 24-bit accelerated graphics card can switch resolutions from the keyboard and offers zoom and pan options. **Oct 94**

★★ **Tornado Graphics Card, Mirror Technologies, 612/832-5622, \$699.** Inexpensive 24-bit accelerated graphics card has zoom and pan options but is relatively slow. **Oct 94** **m**

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Selected and edited by Charles Barrett

The following listings include both time-sensitive promotions and open-ended offers being sponsored by Macintosh vendors and their resellers. Each listing indicates which products have been awarded a star rating in *Macworld's Reviews* (products rated ★★ or lower are not eligible for inclusion), have been selected as an **Editors' Choice**, or have won a **World-Class** award. In some cases, the editorial evaluation quoted is for an earlier product version. The ⚡ symbol indicates that the product is Power Mac related. Except where otherwise indicated, prices given are suggested retail prices.

When placing an order, please mention that you saw the offer in *Macworld*. Should any problems arise, contact the *Streetwise Shopper* editor by fax (415/442-0766), phone (415/978-3241), or mail (*Macworld*, 501 Second St., San Francisco, CA 94107).

Vendors and resellers desiring to have products and services included in this section are encouraged to contact the *Streetwise Shopper* editor with particulars.

BUNDLES

⚡ **Adobe PageMaker 5.0 + PageTools 1.0** Adobe Systems is including Extensis Corporation's \$129 PageTools collection of ten utilities (Dec 94 ★★★★★) free of charge with the CD-ROM version of its \$895 desktop publishing program (Nov 93 ★★★★★ for 680X0 version; 1994 **World-Class**). PageTools adds a customizable tool bar, page preview, and navigation and printing tools. Adobe Type On Call 4.0 (Mar 94 "The Right Font" **Editors' Choice**), a locked CD-ROM containing 2000 fonts, is also included. Registrants get a key to access 220 PostScript Type 1 typefaces from it, along with the opportunity to purchase additional typefaces for \$25 each. Included on the PageMaker disc are TrapMaker, a plug-in module for trapping; CheckList for checking publication printer settings, font usage, style sheets, and linked graphics files; and Adobe Acrobat Reader for viewing documents stored in the Portable Document Format. Call 800/628-2320 for more information and to order. *Offer expires 6/30/95.*

Authorware 3.0 + ⚡ Director 4.0 + ⚡ Macromodel + SoundEdit 16 + Adobe Premiere 4.0 Macromedia is providing the following software free of charge to customers who purchase its \$4995 Authorware multimedia scripting/presentation software (Feb 94 ★★★★★ for version 2.0.1); Macromedia Director, an \$1195 multimedia/animation program (Sep 94 ★★★★★; 1994 **World-Class**); Macromodel, a \$1495 3-D modeler (May 94 ★★★★★); SoundEdit 16, a \$379 digital audio editor (Dec 94 ★★★★★); and Adobe Premiere, a \$795 video editor (Dec 94 ★★★★★; 1994 **World-Class**). Call 800/288-4797 for more information. *Offer good through at least 6/30/95.*

Ethernet Card + Sonic LocalBridge + Sonic SNMP Sonic Systems is including \$250 worth of software products free of charge with its \$99 NuBus, or LC twisted-pair, Ether-

net cards. This software consists of a LocalTalk-to-EtherTalk bridge for a device such as a laser printer or PowerBook, and an SNMP driver for simplifying Ethernet network-management tasks. Call 800/535-0725 for more information.

⚡ **MacTools Pro 4.0 + ⚡ Now Utilities 5.0** MacWarehouse is bundling Now Software's \$129.95 system utility collection (Jan 95 ★★★★★; 1994 **World-Class**) with Central Point Software's \$149.95 MacTools Pro disk utility (May 95 ★★★★★). Available for \$89.95 (regularly \$184.95). Call 800/255-6227 to order MSB 0032. *Offer good while supplies last.*

Master CD + Toast CD-ROM Pro MicroNet is including Astarte's \$1595 Toast CD-ROM Pro recording software free of charge with its \$1995 Master CD, which has the ability to record up to 650MB of data (including audio and video) on a single disk from virtually any storage device, on the fly. The Toast CD-ROM software is also included with MicroNet's \$4995 Master CD Pro, which provides 4x recording speed. Call 800/650-3475 for nearest dealer.

Optima Storage Subsystem + ⚡ Adobe Premiere 4.0 or ⚡ Adobe Photoshop 3.0 Optima Technologies is bundling full versions of two Adobe software applications with its high-end storage subsystems. Promotionally priced solutions for digital video include Adobe's \$795 Premiere video-editing program (Dec 94 ★★★★★, 1994 **World-Class**) bundled with a 4GB to 16GB Fast DAT drive for \$1698, or with a 3.6GB modular RAID subsystem for \$4998. Promotionally priced solutions for prepress and graphics include Adobe's \$895 Photoshop image-editing program (Feb 95 "Innovative Image Editors" **Editors' Choice**; Jan 95 ★★★★★; 1994 **World-Class**) bundled with a 4GB to 16GB Fast DAT drive for \$1698, or with a 4.2GB modular RAID subsystem for \$4998. All four bundles include Optima's \$349 DeskTape 2.0 tape-mounting software. Call 714/476-0515 for more information. *Offer expires 4/30/95.*

PLI Disks + PowerMerge LE PLI is including a limited edition of Leader Technologies' \$129 file-synchronization software (Aug 94 ★★★★★ for PowerMerge 2.0) with its removable disk drive media for backup from desktop Macs to PLI drives. Call 800/288-8754 for more information.

Relisys Scanner + Wacom ArtPad Mac's Place at Egghead is offering Wacom Technology's \$199 ArtPad graphics tablet—which includes the cordless, battery-less, pressure-sensitive UltraPen stylus and driver—free with the purchase of any of five Relisys scanner models, all of which feature a free transparency adapter. Call 800/905-0009 to order the Reli 9612 for \$1398.95 (item #9999BH), Reli 9624 for \$1898.95 (#1000BH), Reli 2412 for \$789.95 (#9990BH), Reli 4816 for \$989.95 (#10001BH), and Reli 4830 for \$1649.95 (#10002BH). *Offer good through at least 4/30/95.*

SingleCharger 500 or PowerCenter 500 + Lind Battery Utilities 2.01 Lind Electronics is including its \$29.95 Battery Utilities 500 software, which analyzes all fixed and variable data stored in the PowerBook 500 series' Intelligent Battery, with each \$59.95 (lowered from \$79.95) Sin-

gleCharger 500 and \$249.95 PowerCenter 500. Both chargers also monitor charging temperatures, test for shorted cells, and recover overcharged batteries. Call 800/897-8994 for more information.

SupraExpress 144 + Delrina FaxPro + Internet Starter Kit Mac's Place at Egghead is offering a bundle consisting of Supra's \$149.95 14.4-Kbps external fax modem; Delrina's \$129.95 FaxPro 1.5.1 software (Feb 94 ★★★★★ for version 1.0); and Adam C. Engst's \$39.95 Internet Starter Kit, a 600-page book and installation disk. A starter disk for Apple's eWorld service, plus ten free hours online, is also included. Available for \$159.95 (item #10332BH) by calling 800/905-0009. *Offer good through at least 4/30/95.*

COMPETITIVE UPGRADES

⚡ **ACT 2.0** Symantec is offering this \$179.95 contact manager (Mar 95 ★★★★★) to registered users of any other contact manager through resellers for around \$99. Call 800/441-7234 for more information.

⚡ **ClarisWorks 3.0** Claris is offering this \$129 integrated software package (Feb 95 ★★★★★; Feb 94 "Integrated Software" **Editors' Choice** for version 2.0.1; 1994 **World-Class**) for \$69 to registered users of Microsoft Excel, Office, Word, and Works; WordPerfect and WordPerfect Works; GreatWorks; RagTime; BeagleWorks; and Lotus 1-2-3. Call 800/544-8554 for more information.

⚡ **Macromedia FreeHand 5.0** Macromedia is offering this \$595 draw program (May 95 ★★★★★) to registered users of MacDraw, Canvas, QuarkXPress, and Adobe Illustrator and PageMaker for \$149. Call 800/989-3762 for more information.

SPECIAL DISCOUNTS

⚡ **CanOpener 3.0** Abbott Systems is offering this new version of its \$125 file-opening utility (May 95 ★★★★★) for \$59 (incl. S&H). Call 800/552-9157 to order. *Offer good through at least 5/31/95.*

In Control For Workgroups Attain is offering a \$299.90 two-user pack of this multiuser version of its project planner and organizer (Oct 94 ★★★★★ for single-user In Control 3.0.4) for an introductory price of \$199.95. Call 800/925-5615 for more information. *Offer expires 6/30/95.*

Select Effects Digital Library CASCOS International is offering the first three volumes of this royalty-free CinePak-compressed video/audio clip collection on CD-ROM at an introductory price of \$199.95 per volume, or \$549.95 for all three. Each \$249.95 volume contains 100 digital video effects in either JPEG or CinePak format and 50 audio tracks that include music beds and sound effects up to one minute in length. A Kodak Browser is included for previewing purposes. Call 800/889-0477 for more information and to order. *Offer good through at least 6/30/95.* **m**

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A. Including yourself, approximately how many people are employed at your entire work-site (i.e., employees in your office, building, or cluster of buildings)? (Check one.)

- 01 ☐ 1000+
02 ☐ 999 - 100
03 ☐ 99 - 25
04 ☐ Under 25

B. Which of the following computers are installed at this entire work-site? (Check all that apply.)

- 05 ☐ Apple Workgroup Servers/
Mac Quadra-series
06 ☐ Mac Centris-series/II-series/LC III/
Performa 600/450/SE 30
07 ☐ Mac LC/LC II/Performa 430/405/
400/200/Classic-series/SE/Plus/
512K/128K/Portable
08 ☐ Mac PowerBook-series/Duo-series

C. What is the total number of Macs installed at this entire work-site? (Check one.)

D. For how many Macintosh computers within this entire work-site do you have purchase involvement for products and/or services? (Check one.)

- | | C | D |
|-----------|-----------------------------|-----------------------------|
| 500+ | <input type="checkbox"/> 09 | <input type="checkbox"/> 15 |
| 499 - 100 | <input type="checkbox"/> 10 | <input type="checkbox"/> 16 |
| 99 - 50 | <input type="checkbox"/> 11 | <input type="checkbox"/> 17 |
| 49 - 10 | <input type="checkbox"/> 12 | <input type="checkbox"/> 18 |
| 9 - 1 | <input type="checkbox"/> 13 | <input type="checkbox"/> 19 |
| None | <input type="checkbox"/> 14 | <input type="checkbox"/> 20 |

E. In which ways are you ever involved in purchase decisions for Macintosh products at this entire work-site? (Check all that apply.)

- 21 ☐ Initiate/Determine need for product/capabilities/features
22 ☐ Evaluate, recommend, or approve brands/models
23 ☐ Evaluate, recommend, or approve purchase source
24 ☐ Authorize purchases

F. Over the next 12 months, how much will this entire work-site spend on Macintosh products and/or services? (Check one.)

- 25 ☐ \$1 million or more
26 ☐ \$999,999 - \$500,000
27 ☐ \$499,999 - \$100,000
28 ☐ \$99,999 - \$50,000
29 ☐ \$49,999 - \$10,000
30 ☐ Under \$10,000

G. Considering the entire work-site, which of the following Macintosh hardware and software products are currently installed? (Check all that apply.)

- 31 ☐ Business software (Word processing, spreadsheet, database, etc.)
32 ☐ Graphics/publishing software
33 ☐ Monitors/displays
34 ☐ Printers/scanners
35 ☐ Networking/communications hardware and/or software
36 ☐ Multimedia/AV hardware and/or software
37 ☐ Mobile computing products (PowerBooks, peripherals, software, etc.)

H. What is your primary job function? (Check one.)

- 38 ☐ Computer Reseller/VAR/VAD
39 ☐ MIS/DP/IS/Network Management
40 ☐ Engineering
41 ☐ R&D/Scientific
42 ☐ Corporate/General Management
43 ☐ Accounting/Finance
44 ☐ Marketing/Sales/PR/Communications
45 ☐ Art/Design/Creative Services

Thank You!

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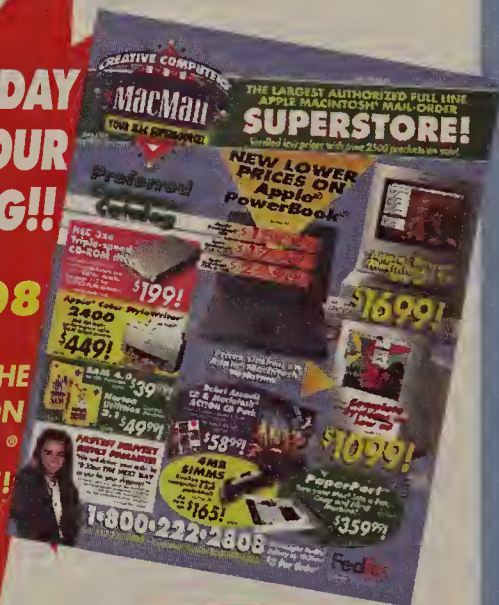


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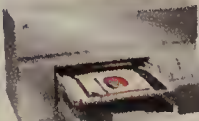


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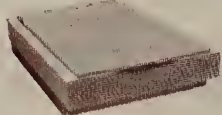
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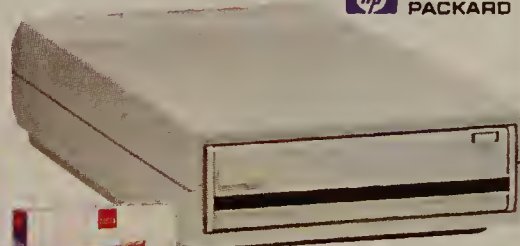
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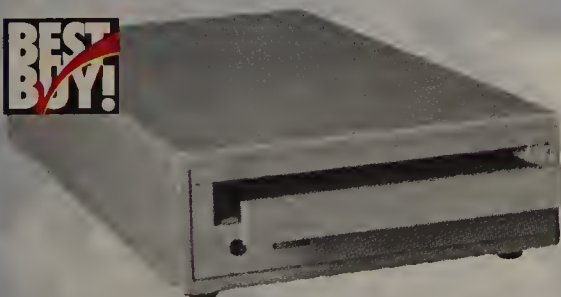


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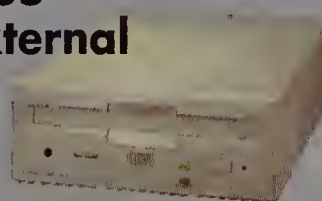
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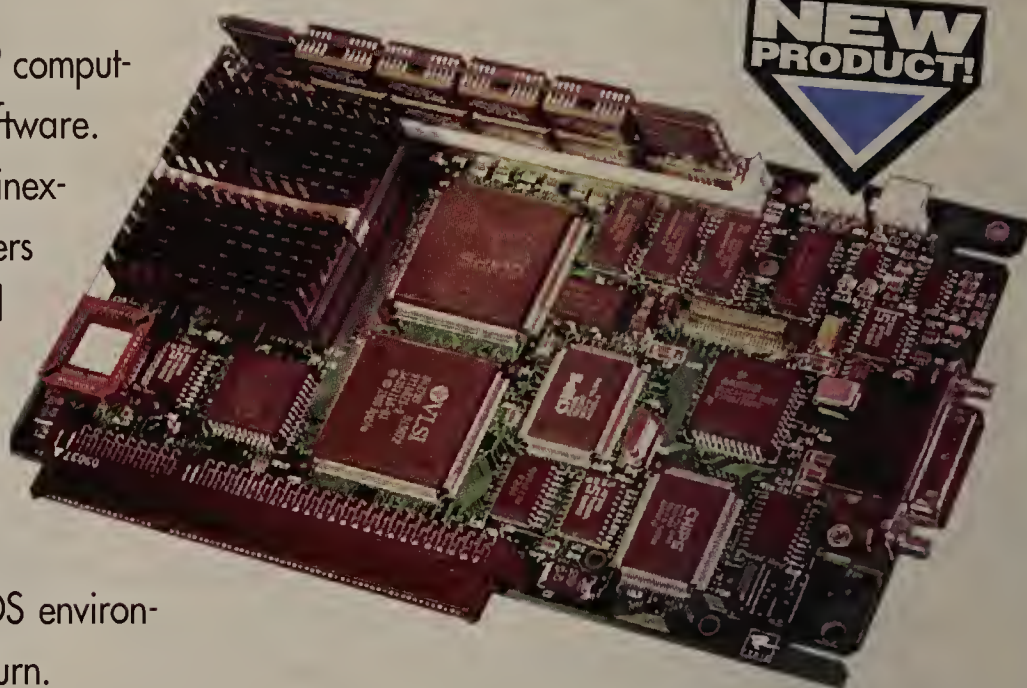
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The Nation's White Pages on CD-ROM. Contains over 81 million directory listings nationwide. Search by name, narrow a search by city, state, street, ZIP and/or area code. Excludes reverse indexing to allow convenient two disc name searching of all 81 million listings.

PhoneDisc Business \$48⁹⁹ #67411

The Top Rated Business Directory. 9.5 million U.S. listings fully indexed on just one CD-ROM. Includes 2,000 different categories of six digit SIC codes. Also allows you to search by word or alternate name to find the right category. Reverse indexing helps you find a business from just an address or phone number. Narrow name or business type searches by city, state, street, ZIP and/or area code.

PhoneDisc Combo Pack \$78⁹⁹ #67412

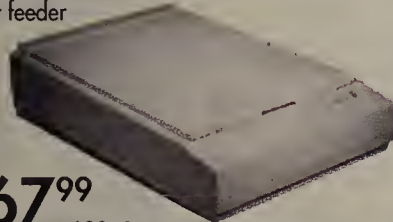
Two great Products, One Great Price! PhoneDisc Residential and PhoneDisc Business bundled together! Holds 91 million listings.

PhoneDisc PowerFinder \$145⁹⁹ #67413

Over 91 million business and residential listings, more than any other product in its price range. Reverse indexing finds a residence or business listings from just an address, phone number or business type. Narrow name or business type searches by city, state, street, ZIP and/or area code.

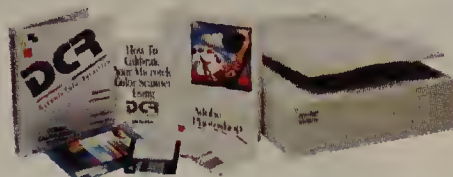
ScanMaker IIHR

- 2400 dpi resolution (interpolated) - true 600x 1200 optical resolution
- Maximum document size 8.5"x13.5"
- Includes a full version of Adobe™ Photoshop 3.0 and OmniPage Direct
- Apple® ColorSync® compatible
- Full grayscale scanning capability
- Optional transparency adapter and automatic document feeder



\$1067⁹⁹ #69352

ScanMaker IISP



The new single-pass ScanMaker IISP Color Flatbed Scanner with DCR™, the most accurate color system calibration available for the desktop, is another price/performance breakthrough from Microtek. Accurate color calibration for more vibrant, saturated and true color which used to be only available at a premium price on high-end scanning equipment. It is also Apple® ColorSync® compatible. Comes complete with Image Editing Software OmniPage Direct.

\$519⁹⁹ #69355

MICROTEK

ScanMaker II

This scanner uses a three-pass scanning method to capture full 24-bit color or 256 shades of grey. Features 300 dpi horizontal, 600 dpi vertical resolution, with a maximum of 1200dpi x 1200dpi through interpolation. Includes Image Editing Software, OmniPage Direct and scan module with Automatic Contrast Control and Display Matching System, making it a snap to get great looking images on the first try.

\$469⁹⁹ #69357

ScanMaker III

The ScanMaker III scans in 36-bit color, capturing images of up to 12 bits per RGB color channel. Scans up to 2400dpi for smoother, more precise color gradations, detailed highlights and rich shadows, accurate midtones and a full photographic dynamic range up to 3.4. Includes FULL version of Adobe™ Photoshop.

\$2487⁹⁹ #64511

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The Nomai Family of SyQuest™ compatible **REMOVABLE CARTRIDGES** provides the optimum in data storage performance. Nomai cartridges are the most shock-resistant cartridges available on the market today. In a recent MacUser review, Senior Editor Mark Frost said, "We mailed 'em, cooked 'em, magnetized 'em and dropped 'em - and these removable cartridges came back for more... None of the cartridges suffered any data loss!" This **TREMENDOUS SHOCK-RESISTANCE** is obtained by DLC (Diamond Like Catalog). DLC protects against airborne particles which results in a long-life cartridge you can trust.

PREFORMATTED and backed by a **5 YEAR WARRANTY**, Nomai offers unparalleled dependability and performance at an **UNBEATABLE PRICE**.



44MB
\$42⁹⁹ #66229

88MB
\$48⁹⁹ #66230

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Supra Express 144 Plus 14.4 Fax/Modem for Mac™

The Supra Express 144 Plus blows ahead of the competition with a winning combination of high-speed, dependability and ease-of-use, all at astonishing low price! This affordable, high quality fax modem offers cost-conscious Mac™ users 14,400 bps fax and data speeds in on attractive, compact external case. It features the SupraExpress LED display, MNP 2-5 and V.42bis hardware-based compression. Includes: FAXcilitate® fax software and MicroPhone® data software, all cables, easy-to-read manuals and a 5 Year Limited warranty.



\$99⁹⁹ #67021

Supra FAX Modem 288™

These fast 28.8 modems offer 28,800 bps fax/data speeds with V.34 and a maximum throughput of 115,200 bps and fax speeds of 14,400.

Receives fax and voice calls on one line.

Displays info on incoming calls. Includes

Flash ROM for end-user upgrading, FAXcilitate 1.7

Microphone™ LT and CompuServe Information Manager software,

CCL script for ARA, manuals and cables. Five year warranty.



\$239⁹⁹ #67622

Supra 14.4 LC Fax Modem

14,400 bps fax/data speeds with a maximum throughput of 57,600 bps. Caller ID. Includes:

FAXcilitate 1.6, Microphone™ LT and CompuServe Information

Manager software, CCL scripts for ARA,

manuals and cables. Five year warranty.

\$138⁹⁹ #61560

Record Live Video to Your VCR

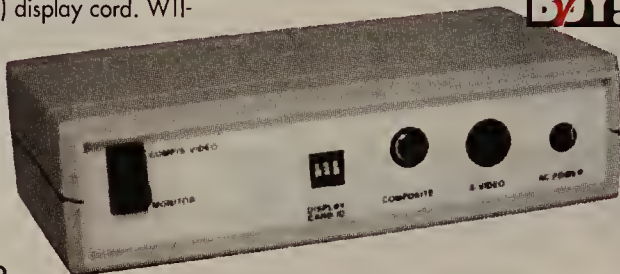
WTI-VideoMax™

Converter for Macintosh® II RGB
to NTSC/PAL output

WTI-VideoMax is an inexpensive standalone solution for recording live video from your Macintosh® II computer to video tape. It connects directly to the output of your Apple® (or compatible) display cord. WTI-

VideoMax has two outputs one which gives you the NTSC or PAL compatible video signal and another which connects to your existing display monitor.

\$79⁹⁹ #67579



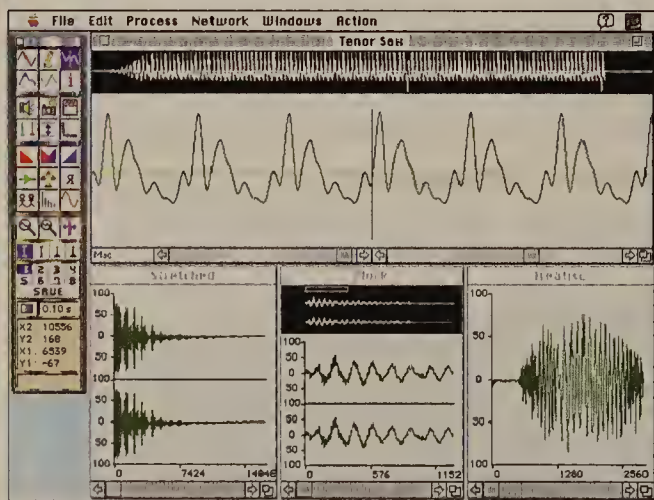
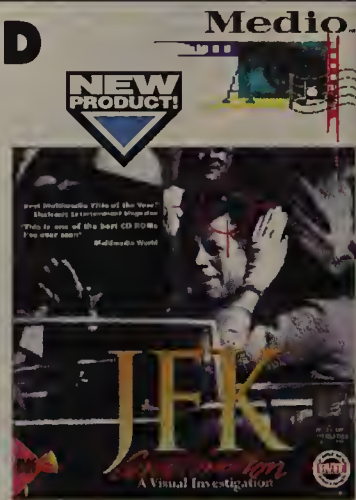
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Experience for yourself one of the most shocking events of the 20th century. Relive the wrenching drama of November 1963, the events that foreshadowed it, and the historic days that followed. Full-motion video clips including eyewitness films show you all of it. You even get the full text of Jim Marrs' book "Crossfire" and The Warren Commission Report. Media presents facts. Judgements are left to you as you became investigator, analyst, judge, jury - an eyewitness to history. You decide what really happened.

\$36⁹⁹ #69309



ALCHEMY

The Premier sample editor...

Alchemy is the world's most powerful Macintosh® 16-bit stereo sample editor. Alchemy 3.0 is the fastest and most elegant way to retrieve, record, play back, edit, and store sampled sounds, period. Alchemy 3.0's Distributed Audio Network (DAN) enables you to archive the sounds for several different sampling devices and digital audio boards in a single, convenient sound library. Features like (UST) Unified Sampling Technology™, Fast Fourier Transform analysis and resynthesis, true stereo editing, automated fades and crossfades, digital delays, Digidesign® and Sound Manager 3.0 support, and high-resolution sample rate conversion, combine to make Alchemy 3.0 an indispensable tool for any sound designer.

- Flexible waveform display with multiple levels of zoom.
- Loop Splice Mode provides sample-accurate high-resolution display and editing of the critical loop splice point. Automatic zero-crossing detection simplifies looping decisions.
- Open an unlimited number of waveform windows.
- Eight user-definable views for each sound file with independent zoom levels and display areas.

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#66954



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HARD DRIVES

The Seagate Elite 9 External
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5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	INTERNAL	EXTERNAL
530MB**	3.5"	13MS	\$ 279	\$ 339

Seagate

5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	MODEL	EXTERNAL
1.2GIG	3.5"	9MS	ST31230N	\$ 645
2.5GIG	3.5"	8MS	Barracuda 2 LP	\$ 1165
2.5GIG	3.5"	8MS	Barracuda 2 WIDE	\$ 1299
2.4GIG	3.5"	9MS	ST12450W Dual Head	\$ 1629
4.1GIG	3.5"	8MS	Barracuda 4	\$ 1995
4.1GIG	3.5"	8MS	Barracuda 4 wide	\$ 2195
9.0GIG	5.25"	11MS	Elite 9	\$ 3195

CONNER

5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	MODEL	EXTERNAL
545MB**	3.5"	12MS	CFA540S	\$ 364
2.1GIG	3.5"	9MS	CFP2105S	\$ 995
2.1GIG	3.5"	8MS	CFP2107S	\$ 1245
4.2GIG	3.5"	9MS	CFP4207S	\$ 1755

Quantum

5 YEAR WARRANTY

CAPACITY	SIZE	ACCESS	MODEL	EXTERNAL
1.0GIG	3.5"	9MS	E1080S	\$ 645
2.2GIG	3.5"	9.5MS	E2160S	\$ 1099
4.3GIG	3.5"	9MS	4280S	\$ 2095

HITACHI

CAPACITY	SIZE	ACCESS	INTERNAL	EXTERNAL
530MB**	3.5"	6300RPM 13MS	\$ 585	\$ 645

POWERBOOK-CORNER

240MB	14MS	internal	\$315
340MB	14MS	internal	\$385
514MB	14MS	internal	\$445
Datasonix Mobile Storage			\$649



SyQuest®

88MB	SQ5110C	\$365
200MB	SQ5200	\$485
270MB	SQ3270	\$485

MONITORS

ny GDM-15SF1 15"	\$435
ny CPD-17SF1 17"	\$889
ny GDM-20SE1 20"	\$1899

CD ROMS

Sony cdu-55s	\$ 235
Toshiba 4101	\$ 285
Toshiba 3501 4 Speed	\$ 395
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Ricoh CD-Recorder Dual Speed	\$ 1575
1.2MB Buffer so you won't get data transfer interruptions. And 680MB media10 pack for only \$ 99. Just set the recording format, select the files, and hit create.	

SCANNERS

MUSTEK 1200dpi Color (2400 with interpolation) including transparency unit and software. Everything included for Mac, Dos, Windows	\$889
MUSTEK 600dpi Color 8.5"x14"	\$499



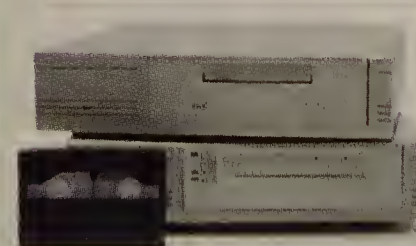
OPTICAL DRIVES

230 MB EXTERNAL \$699

INCLUDES ONE CARTRIDGE

1 YEAR WARRANTY

CAPACITY	MODEL	ACCESS	EXTERNAL
230MB	Fujitsu	30MS	\$ 699
230MB	Olympus	28MS 4200 RPM	\$ 799
1.3GB	NEC	32MS	\$ 1899
1.3GB	Sony	40MS	\$ 1999
1.3GB	Ricoh Turbo	19MS	\$ 2175



TAPE BACK-UP

DC DAT 2GIG External
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INCLUDES TAPE + RETROSPECT SOFTWARE

2 YEAR WARRANTY

CAPACITY	MODEL	MEDIA	INTERNAL	EXTERNAL
250MB	Tandberg TDC 3660	DC6250	\$ 445	\$ 499
1.3-2GIG	DC DAT	4MM	\$ 709	\$ 769
1.3-4GIG	DC DOUBLE DAT	4MM	\$ 839	\$ 899
4.0-8GIG	Connor 4326 DDS-2	4MM	\$ 1089	\$ 1149
4.0GIG	Sony 5200 DDS-2	4MM	\$ 939	\$ 999
4.0-8GIG	Sony 5000 DDS-2	4MM	\$ 969	\$ 1029
1.3-10GIG	Exabyte 8505	8MM	\$ 2179	\$ 2259
7.0-14GIG	Exabyte 8505XL	8MM	\$ 2185	\$ 2245
10-20GIG	Quantum DLT (DIGITAL LINEAR)	1/2	\$ 3575	\$ 3675

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230MB Optical	\$ 35	112M Tape	\$ 15
650GIG Optical	\$ 79	120M Tape	\$ 20
1.3GIG Optical	\$ 99	CD ROM 10 Pack	\$ 99
SYQUEST 44MB	\$ 42	SYQUEST 88MB	\$ 48
SYQUEST 200MB	\$ 76	SYQUEST 270MB	\$ 64



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CLUBMAC QUAD-SPEED CD-ROM DRIVE

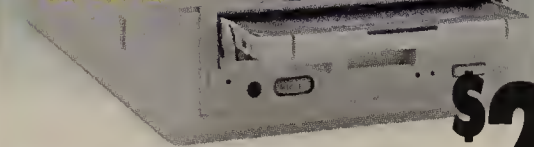
FEATURES

- Quad-Speed CD-ROM Reader
- 600KB/sec data transfer rate
- 220ms average access time
- 256K data buffer
- Includes CD Caddy
- LED light, headphone jack and RCA jacks
- Kodak PhotoCD (Multisession) compliant
- CharisMac's CD AutoCache driver software
- 100,000 hours MTBF
- ONE Year Warranty

ClubMac
NEW PRODUCT



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C109 9502



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- Maya Clinic
- Money in the 90's
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C109 1010

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C109 1011

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CLUBMAC DOUBLE-SPEED CD-ROM DRIVE

FEATURES

- Double Speed CD-ROM Reader
- 300KB/sec data transfer rate
- 250ms average access time
- 256K data buffer
- Caddy-less design
- LED light, headphone jack and RCA jacks
- Kodak PhotoCD (Multisession) compliant
- Includes CharisMac's CD AutoCache driver software
- 30,000 hours MTBF
- ONE Year Warranty

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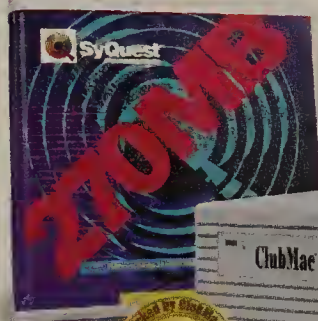
ClubMac 3.5" 270MB Removable

INCLUDES FREE CARTRIDGE

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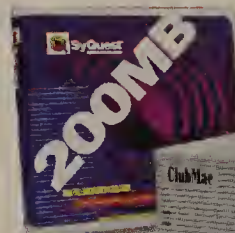
ACTIVE TERMINATION

MacUser
★★★★
February 1995



C109 1003

\$478



ClubMac 5.25" 88MB Removable

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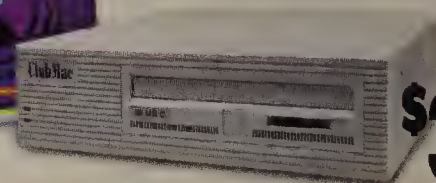
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C109 1002

\$349



GENUINE SYQUEST CARTRIDGES

Part No.	Media	Qty 1	Qty 10	Qty 20
S198 1010	44MB	\$43ea	\$42ea	\$41ea
S198 1011	88MB	\$48ea	\$47ea	\$46ea
S198 1012	200MB	\$76ea	\$74ea	\$72ea
S198 1013	105MB	\$55ea	\$53ea	\$51ea
S198 1014	270MB	\$62ea	\$61ea	\$60ea

5 YEAR WARRANTY

NEW LOW PRICES

ClubMac SyQuest drives include a TWO Year Warranty, ONE FREE formatted cartridge, SCSI Director Formatting Utility, power cable, and documentation. SyQuest cartridges include a FIVE Year Warranty. (*Warranty after the first year is handled by SyQuest)

Quantum

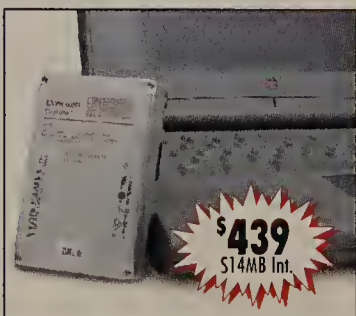


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The Quantum Daytona Drives are high-capacity 2.5-inch hard drives that provide unmatched mass storage solutions for the Apple PowerBooks.

2.5" PowerBook Drives

Capacity	Access	Internal	External
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341MB	17ms	\$325	\$445
514MB	17ms	\$439	\$559



\$439
\$14MB Int.

MAVERICK SERIES

ACTIVE TERMINATION

Capacity	Access	Internal	External
3.5" Low Profile			
540MB	14ms	\$245	\$305

LIGHTNING SERIES

ACTIVE TERMINATION

Capacity	Access	Internal	External
3.5" Low Profile			
365MB	11ms	\$199	\$259
540MB	11ms	\$265	\$325
730MB	11ms	\$285	\$345

Quantum Daytona, Maverick, Lightning, Empire, Grand Prix, and Atlas series include a TWO Year Warranty. Quantum Daytona series include a ONE Year Warranty.

EMPIRE SERIES

ACTIVE TERMINATION

Capacity	Access	Internal	External
3.5" Low Profile			
1080MB	9.5ms	\$599	\$659
3.5" Half Height			
2100MB	9.5ms	\$989	\$1049

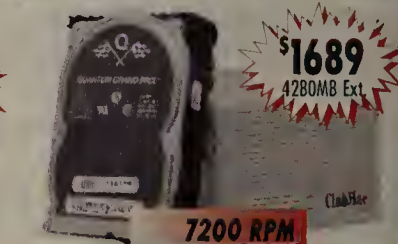


\$659
1080MB Ext.

GRAND PRIX/ATLAS

ACTIVE TERMINATION

Capacity	Access	Internal	External
3.5" Half Height			
2100MB	8.6ms	\$1029	\$1089
4280MB	8.6ms	\$1629	\$1689



\$1689
4280MB Ext.

7200 RPM

Seagate

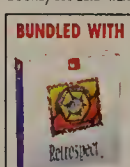
5 YEAR WARRANTY

SHIPPING WITH ACTIVE TERMINATION

Unformatted Capacity	Model	Description	Access Time	Actual Capacity MAC	Internal	External
3.5" Half Height & Low Profile						
2.4GB	ST32430N	Hawk 2 LP	9ms	2000MB	\$999	\$1059
4.3GB	ST15230N	Hawk 4	9ms	4000MB	\$1559	\$1619
2.5GB	ST32550N	Barracuda 2 LP	8ms	2050MB	\$1099	\$1159
4.3GB	ST15150N	Barracuda 4	8.5ms	4000MB	\$1839	\$1899
5.25" Full Height						
9.1GB	ST410800N	Elite-9	11ms	8600MB	\$3299	\$3399

CLUBMAC TAPE BACKUP DRIVES

The ClubMac 2.0GB DAT drive features 20sec access time, up to 266KB/sec data transfer rate, SCSI-1/SCSI-2 and 60,000 hrs MTBF.



\$729

SHIPPING WITH **ACTIVE TERMINATION**

C109 S011

C109 S010

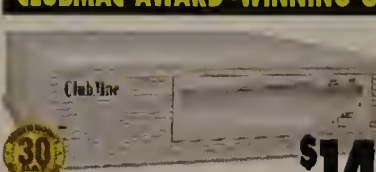
ClubMac 2.0GB DAT \$729

ClubMac 4-8GB DAT (DDS-2) \$949

ClubMac DAT drives include a TWO Year Warranty, Retrospect v2.1 Backup Software, ONE 90m DAT tape (ONE 120 DAT tape for 4-8GB).

CLUBMAC AWARD-WINNING OPTICAL DRIVES

ACTIVE TERMINATION



\$1499

ClubMac 5.25" Sharp 1.3GB
• 39ms ave. seek time
• 3,000 RPM rotational speed
• 80,000 hrs MTBF
C109 4750

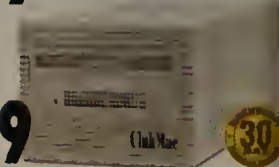
ClubMac 3.5" Olympus 230MB

C109 S021

- 28ms ave. seek time
- 4,200 RPM rotational speed
- 50,000 hrs MTBF

MacUser
★★★★
February 1995

\$699



ClubMac OPTICAL drives include a ONE Year Warranty, FREE formatted optical disk & SCSI Director Formatting Software.

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- Mac and PC compatible
- Fine 0.28mm dot pitch
- 640 x 480 up to 1024 x 768 resolution

\$445

14" MultiSync 2V (N026 1016) **\$335**

15" MultiSync XV15 (N026 1015) **\$445**

15" MultiSync XE15 (N026 1006) / XP15 (N026 1005) **\$569 / 659**

17" MultiSync XE17 (N026 1007) / XP17 (N026 1009) **\$999 / 1225**

21" MultiSync XE21 (N026 1010) / XP21 (N026 1011) **\$1989 / 2435**

IntelliColor Display/20e

The Radius IntelliColor Display/20e is part of the next generation in professional two-page color displays. It delivers unrivaled command of your desktop, from on-the-fly resolution switching to state-of-the-art color temperature control. Combined with Radius' IntelliColor software, it allows you to emulate 3 lighting conditions and user-adjustable color temperature, so you get more accurate color representation.

R016 1013 PressView 21T Display System

(PV2102) 21" Trinitron, 640 x 480 to 1600 x 1200 **\$3119**

R016 1016 SuperMatch 21-T XL Trinitron (ST02102) 21" Trinitron, 1600 x 1200 **\$2139**

R016 1009 IntelliColor Display/20e (0461) 20" Trinitron, 640 x 480 to 1600 x 1200 **\$1979**

R016 1007 PrecisionColor Display/17 (0460) 17" Trinitron, 640 x 480 to 1600 x 1200 **\$989**

R016 1015 SuperMatch 17-T PRO (ST01702) 17" Trinitron, 1360 x 1024 **\$829**

VideoVision Studio 2.0

With JPEG hardware compression and decompression for full-screen, full-motion recording and playback from a hard disk, VideoVision Studio combines the power and flexibility of the Macintosh with the ease and transportability of video tape.

R013 1018 VideoVision Studio 2.0 (0500) NEW and IMPROVED, compatible with the PowerMac 8100 **\$3779**

R013 1020 VideoVision Studio 2.0 Upgrade (0505) JPEG daughtercard **\$1789**

R013 1026 Spigot Power AV (0V1630) captures full-screen 24-bit color video up to 30 frames/60 fields per sec **\$759**

\$1979



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ColorComposer software

radius

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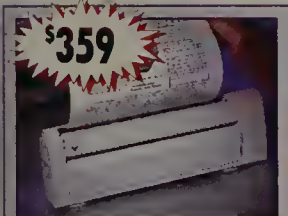
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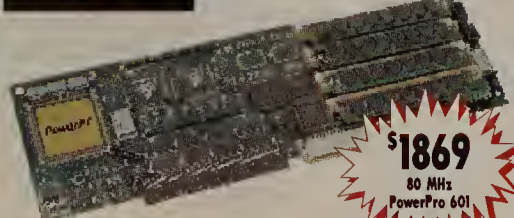


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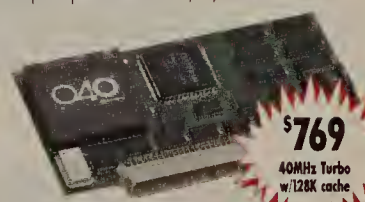
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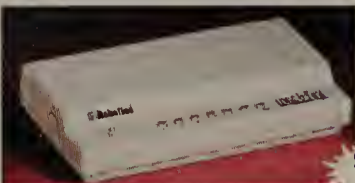


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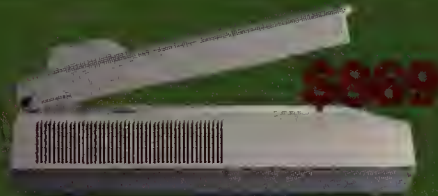


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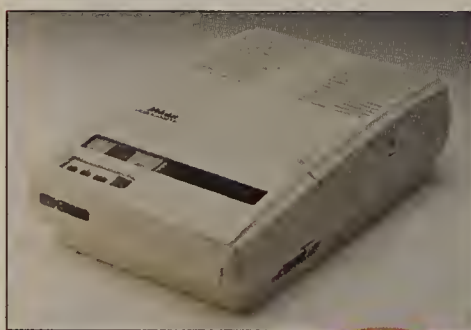
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19717	NEC XE15 15" Color Mtr.	\$537.98
19718	NEC XE17 17" Color Mtr.	\$997.98
19720	NEC XE15 15" Color Mtr.	\$658.98
19721	NEC XE17 17" Color Mtr.	\$1,235.00
19722	NEC XE21 21" Color Mtr.	\$2,446.00
VIDEO/GRAPHICS BOARDS		
radius		
93650	Photo Engine	\$849.00
05893	Precision Color 8XJ 8-bit	\$455.98
98862	PrecisionColor Pro 24X	\$1,070.00
97892	PrecisionColor Pro 24XK	\$797.98
93683	Video Vision Studio 2.0	\$3,598.00
SUPERMAC		
97898	Power DSP Upgrade	\$496.98
97879	Spectrum Power 1152	\$686.98
93684	Spigot Power AV	\$799.98
05913	Thunder 24 V2.0	\$979.98
92642	Thunder IV GT	\$1,388.98
92636	Thunder IV GX 1600	\$2,939.98
92634	Thunder IV GX 1360	\$2,398.98
92637	Thunder IV GX 1600	\$1,985.98
97857	Video Spigot II Tape	\$699.98
ACCELERATORS		
DAYSTAR		
95398	33MHz Univ Turbo 040 128K Cache	\$619.98
95397	33MHz Univ Turbo 040 128K Cache	\$647.98
97262	33MHz Value 040 FPU 128K Cache	\$825.98
97260	33MHz Value 040 128K Cache	\$647.98
95399	40MHz Univ Turbo 040 128K Cache	\$889.98
97263	40MHz Value 040 FPU 128K Cache	\$989.98
98804	Charger	\$499.98
06482	Charger Plus	\$619.98
95350	PowerPro 601 66MHz Xel	\$1,299.00
95351	PowerPro 601 80MHz Xel	\$1,999.00
92169	Turbo 601/66mhz	\$1,197.00
92168	PowerCard 66mhz	\$638.98
NETWORKING		
NASANTÉ		
05501	10T FriendlyNet Adapter	\$52.98
00348	10T HUB/12 w/ 10T/TN Ports	\$351.98
00404	10T HUB/8 w/ 10T/TN Ports	\$223.98
06104	Asante Print (10T/TN)	\$327.98
96842	Asante Print 8 (AUI/10T)	\$347.98
94145	MacCon-I LC 10T/TN	\$69.98
94147	MacCon-I LC 10T/TN	\$165.98
98802	MacCon-I LC TN	\$109.98
94143	MacCon-I NuBus 10T/TN	\$89.98
94144	MacCon-I NuBus TN/TN	\$117.98
03647	MC + 301E64 IISI & SE/30 (TK/TN)	\$147.98
03646	MC+301E64 IISI & SE/30 (TK/10T)	\$145.98
03642	MC+HIE64 Mac II & Performa 600 (TK/10T)	\$153.98
03641	MC+HIE64 Mac II & Performa 600 (TK/TN)	\$153.98
99950	MC+LCIII LC, LCII, LCIII (TN/10T)	\$184.98
04933	MC3IISI IISI & SE/30 (TK/TN/10T)	\$194.98
00511	MC3NB Mac II&Performa 600 (TN/TK/10T)	\$198.98
99952	MLCL10TIII LC, LCII, LCIII (10T)	\$155.98
99951	MLCL10TIII LC, LCII, LCIII (TN)	\$155.98
94118	Micro EN/SC for PowerBooks 10T	\$218.98
94119	Micro EN/SC for PowerBooks10T/TN	\$278.98
06817	Mini EN/SC for PowerBooks (10T)	\$199.98
06818	Mini EN/SC for PowerBooks (10T/TN)	\$228.98
96840	NetExtender Hub (AUI/10T)	\$119.98
96841	NetExtender Hub FN (AUI/10T)	\$129.98
05500	Thick FriendlyNet Media Adapter	\$59.98
05499	Thin FriendlyNet Media Adapter	\$54.98
Doyno		
96826	Dayna Pocket SCSI Link M (10T/TN)	\$287.98
96825	Dayna Pocket SCSI Link T (10T)	\$235.98
94114	DaynaLINK Mobile Access Server I/ARA	\$1,998.98
04718	DaynaPDRT E/I (TN/TK) DP0200	\$114.98
05728	DaynaPDRT E/I-3 (10T/TK/TN) DP0201	\$159.98
04595	DaynaPDRT E/I-1 (10T/TK) DP0201	\$107.98
00806	DaynaPDRT E/LC (TN) DP0400	\$107.98
98404	DaynaPDRT E/LC-M (10T/TN) DP0403	\$157.98
05190	DaynaPDRT SCSI Link-3 (10T/TK/TN) V PB	\$299.98
00488	DaynaPDRT SCSI Link-3 DP0802	\$278.98
98405	DaynaPDRT SI/30-3 (10T/TK/TN) DP0513	\$159.98
98401	DaynaPDRT SI/30-2 (10T/TK) DP0511	\$145.98
99962	DaynaSTAR Hub-24	\$868.98
94115	DaynaSTAR MiniHub-5	\$147.98
94116	DaynaSTAR Stack 12	\$688.98
94117	DaynaSTAR Stack 24	\$1,189.00
05279	EasyNet Transceiver 10T/AAUI	\$55.98
05280	EasyNet Transceiver TN/AAUI	\$55.98
06595	EtherPrint 3 (10T/TK/TN)	\$353.98
06622	EtherPrint 3 Plus (10T/TK/TN)	\$469.98
93562	Mini EtherPrint Plus 10T/TN	\$429.98
93559	Mini EtherPrint-T 10T	\$349.98
93560	Mini EtherPrint-T 10T/TN	\$359.98
93561	Mini EtherPrint-T Plus 10T	\$419.98

Farallon		
93588	Ether 10T Starlet/16	\$568.98
93587	Ether 10T Starlet/4	\$168.98
05693	Ether 10T Starlet/8	\$238.98
03333	Ether10-T StarController	\$1,049.00
04307	Ether10-T Transceiver (AUI/10T)	\$51.98
03475	Ether10-T Transceiver (AUI/10T)	\$64.98
98848	EtherThin Transceiver (AUI/TN)	\$61.98
98849	EtherThin Transceiver (AUI/TN)	\$61.98
98409	EtherWave AUI Transceiver	\$95.98
98408	EtherWave AUI Transceiver	\$92.89
98412	EtherWave LC Card	\$167.98
98411	EtherWave NuBus Card	\$169.98
98414	EtherWave P8 or Slot-less Mac Adapter	\$279.98
98413	EtherWave PC ISA Card	\$189.98
98410	EtherWave Printer Adapter	\$279.98
04160	PhoneNET Connector 50pk PN350	\$798.98
00955	PhoneNET DB-9 PN309	\$34.00
00828	PhoneNET DIN-8 10pk PN310	\$184.98
00832	PhoneNET DIN-8 PN308	\$26.98
02779	PhoneNET Star Connector PN301	\$14.98
COMMUNICATIONS/MODEMS		
Global Village		
95206	Dne World Fax 1 Line, LocalTalk	\$839.98
95207	Dne World Fax 2 Line, Ethernet	\$1,259.00
95209	Dne World Remote Acc 2 Line, Ethernet	\$1,598.00
05686	PowerPort Bronze	\$89.98
05684	PowerPort Gold	\$232.98
98182	PowerPort/Mercury for PowerBook 1XX	\$309.98
98183	PowerPort/Mercury for PowerBook Duo	\$309.98
94388	PowerPort/Mercury for PowerBook 5XX	\$338.98
06267	TelePort Gold	\$217.98
93748	TelePort Gold II	\$125.98
98181	TelePort/Mercury for Desktop Macs	\$271.98
Supra		
93736	Supra Express 144 Plus	\$95.98
99308	Supra FaxModem 144LC Ext - Mac	\$128.98
06865	Supra FaxModem 144PB Int - PowerBook	\$205.98
96582	Supra FaxModem 288 Ext - Mac	\$208.98
96583	Supra FaxModem 288 Int - Mac P8	\$285.98
00413	Supra FaxModem V.32BIS (MC) w/Std Cable	\$181.98
Robotics		
93701	Mac & Fax Sportster 14.4	\$112.98
92953	Mac & Fax Sportster 28.8 V.34	\$247.98
STORAGE SYSTEMS		
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Makers of Bernoulli		
93320	Iomega MacTransportable 230	\$452.98
96810	Iomega MacTransportable 90 Pro	\$280.98
96811	Iomega MacTransportable Multidisk 150	\$421.98
Pinnacle Micro		
92403	RCD 1000 Recordable CD-Rom	\$1,878.00
93302	Sierra 1.3GB Optical	\$2,779.00
93303	Sierra 2.6GB Optical	\$5,448.98
93301	Tahoe 230M8 Optical	\$879.98
PLI		
94112	Infinity 230MB Optical 3.5"	\$1,068.00
96821	Infinity MAX Optical 5.25 1.3GB	\$3,188.00
96823	Infinity 270 Turbo S	\$537.98
95364	Infinity 200 Removable Drive	\$638.98
FWB		
06271	CD-RDM Toolkit	\$47.98
05476	Hard Disk Toolkit - Personal Ed.	\$46.98
00555	Hard Disk Toolkit	\$122.98
94121	SCSI JackHammer	\$599.00
LoCie		
93569	D Drive External 170MB	\$297.98
03695	D Drive External 270MB	\$314.98
03697	D Drive External 340MB	\$338.98
03698	D Drive External 540MB	\$394.98
03949	D Drive External 1080MB	\$789.00
93567	D Drive External 1400MB	\$1,045.00
93564	PocketDrive 85MB	\$212.98
93565	PocketDrive 170MB	\$338.98
93566	PocketDrive 256MB	\$422.98
Apple Hard Drives		
93593	270MB Ext HD	\$359.98
95348	340MB Ext HD	\$373.98
95338	540MB Ext HD	\$432.98
93568	1080MB Ext HD	\$839.98
Internal HD		
06733	Quantum 170MB	\$217.98
97960	Quantum 270MB	\$237.98
06941	Quantum 340MB	\$287.98
92056	Quantum Lightning 730MB	\$309.98
99929	Quantum 1GB	\$846.98
06736	Quantum 1.2GB	\$997.98
97991	Seagate 2.1GB Barracuda	\$1,795.00
External HD		
06728	Quantum 170MB	\$265.98
97961	Quantum 270MB	\$307.98
06942	Quantum 340MB	\$357.98
01108	Quantum 540MB	\$406.98
99927	Quantum 1GB	\$797.98
94065	Seagate 2.1 GB Barracuda	\$1,989.00
PowerBook HD		
94074	256MB 2.5 Drive	\$305.98
99176	340MB 2.5 Drive	\$439.98
Removable HD		
06538	SyQuest 44/88MB w/o cartridge	\$312.98
01142	SyQuest 200MB w/o cartridge	\$471.98
97989	SyQuest 270MB w/o cartridge	\$459.98
INPUT DEVICES		
AGFA		
Agfa		
02135	Arcus II	\$2,729.98
02102	StudioScan	\$678.98
02103	StudioScan II	\$869.98

Epson		
02110	ES-1200C Pro Scanning System	\$1,278.98
02133	ES-1200C	\$949.98
Colcomp		
95241	Drawing Slate 12x12 Cordless 48 Cursor	\$224.98
95242	Drawing Slate 12x12 Cordless 68 Cursor	\$244.98
98251	Drawing Slate 12x12 w/ Pressure Pen	\$224.98
95243	Drawing Slate 12x18 Cordless 48 Cursor	\$369.98
95244	Drawing Slate 12x18 Cordless 68 Cursor	\$369.98
93495	Drawing Slate 12x18 w/ Pressure Pen	\$499.98
93496	Drawing Slate 6x9 w/ Fractal Painter 3.0	\$469.98
99380	Drawing Slate 6x9 w/ Pressure Pen	\$189.98
Hewlett Packard		
92610	ScanJet 3P	\$484.98
92601	ScanJet IICX	\$937.98
Logitech		
93628	Thinking Mouse	\$89.98
95612	TrackMan II	\$68.98
MICROTEK		
06024	ScanMaker IIG	\$397.98
06251	ScanMaker II	\$496.98
06945	ScanMaker IIS	\$746.00
06252	ScanMaker IIX	\$874.98
01120	ScanMaker IIR	\$1,038.00
06903	35T Slide Scanner	\$934.98
01122	ScanMaker III	\$2,486.00
06821	Automatic Document Feeder	\$360.98
RELISYS		
97971	Avec 2400LE	\$487.98
01176	Reii 4816T w/Photoshop	\$1,349.98
01170	Reii 9624T w/Photoshop	\$1,899.98
UMAX		
The Magic of Color		
06905	UC 630 w/Photoshop LE	\$589.98
01184	Powerlook	\$2,999.00
01179	Vista S6	\$747.98
02175	UC 1260 w/Full Photoshop	\$1,097.00
Wocom		
03677	12x12 Std. Cordless Pressure Stylus	\$659.98
06593	ArtZ 6x8 Graphics Tablet	\$299.98
92687	ArtPad 4x5 AD8 Graphics Table	\$134.98
92686	ArtZ ADB w/Fractal Painter 3.0	\$614.98
CD-ROM/MULTIMEDIA		
NEC		
19728	NEC 3XP Plus CD-ROM	\$384.98
19726	NEC 2V CD-ROM	\$224.98
19724	NEC 4Xe CD Rom Drive	\$479.98
98134	Apple Design Powered Speakers	\$154.98
01199	Performant Mini 2X CD-ROM	\$171.98
13166	Sony SRS-D2K Speakers w/ Subwoofer	\$134.98
02168	Yamaha M10 Shielded Speakers	\$64.98
PRINTERS		
CoStar		
95505	LabelWriter XL	\$148.98
95506	LabelWriter XL Plus	\$237.98
Epson		
19270	Stylus Color Ink Jet Printer	\$509.00
Forgo		
92705	PrimeraPro	\$1,429.98
hp		
HEWLETT PACKARD		
92619	HP DeskWriter 320	\$308.00
92617	HP DeskWriter 540	\$299.98
95522	HP DeskWriter 560C	\$480.98
21151	HP LaserJet 4ML	\$999.00
21155	HP LaserJet 4M Plus	\$1,956.00
21157	HP LaserJet 4SI MX	\$4,210.00
21159	HP LaserJet 4MV	\$2,824.00
Nikon		
02136	CoolPrint	\$1,539.98
Texas Instruments		
06859	MicroWriter PS23	\$599.98
14319	MicroLaser Pro 600 PS23	\$1,196.98
14320	MicroLaser Pro 600 PS65	\$1,523.00
19899	MicroLaser Power Pro	\$1,62

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1994 Consultants Choice Awards
Macintosh Consultants Network

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Internal configuration



Macworld 1994 World-Class Awards:

- ★ Best Customer Service
- ★ Storage
- ★ Alternative Storage

Macworld 1993 World-Class Award:

- ★ APS Hard Drive Series

Consultants Choice Award 1994:

- ★ Best Technical Support

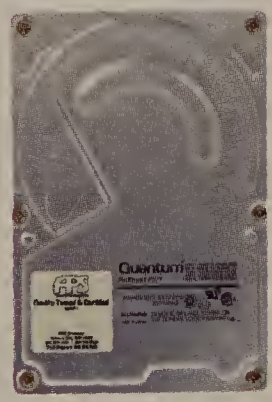
MacUser Editor's Choice Award 1993:

- ★ Best New Storage Product



APS Q 2.0

APS Q 730



ONLY!
\$279⁹⁵
Internal configuration

APS Q 730

With an average seek time of 11 ms and an average access time of 20 ms, the APS Q 730 is a great drive for any user. A formatted capacity of almost 700MB, this drive can handle all your data intensive needs.

APS Q 2.0

The new high-performance, high capacity APS Q 2.0 may just be the answer to your file server or graphics storage needs. At 7200 rpm and boasting average seek and access times of 5.8 and 13 ms respectively, the APS Q 2.0 is the one to turn to for performance and value.

ARRAID™

Get up to 30% better performance out of Photoshop or Quark, and an increase in video throughput of up to 90% to 95% with ARRAID. From graphics and video professionals to systems managers and database administrators, ARRAID provides remarkable speed and fault-tolerant reliability to get your projects done faster.



APS HARD DRIVES

For your Mac or Power Mac

Model	Capacity	Internal	SR2000
349-2040MB			

APS Q 365 ²	349MB	\$179 ⁹⁵	\$279 ⁹⁵
Quantum 365 Lightning			
APS Q 730 ²	699MB	279 ⁹⁵	379 ⁹⁵
Quantum 730 Lightning			
APS ST 1.0 ⁵	1010MB	549 ⁹⁵	649 ⁹⁵
Seagate ST 31230N Hawk			
APS Q 1.0 ⁵	1025MB	699 ⁹⁵	799 ⁹⁵
Quantum Atlas 3107 mechanism			
APS Q 2.0 ⁵	2050MB	999 ⁹⁵	1099 ⁹⁵
Quantum Atlas 3215 mechanism			
APS MS 2.0 ⁵	1955MB	999 ⁹⁵	1099 ⁹⁵
Micropolis 4221 mechanism			
APS MS 2.0av ⁵	1955MB	1099 ⁹⁵	1199 ⁹⁵
Micropolis 4221AV mechanism			
APS ST 2.0 ⁵	2040MB	1199 ⁹⁵	1299 ⁹⁵
Seagate ST 32550N Barracuda			

DaTerm™ patent pending
Copyright © 1995 APS Technologies
Internal drives for Quadra 800 and Centris 610 available
1-5 Denotes length of manufacturer's warranty

Model	Capacity	Internal	SR2000
4095-9090MB			

APS MS 4.0 ⁵	4095MB	\$1499 ⁹⁵	\$1599 ⁹⁵
Micropolis 3243 mechanism			
APS MS 4.0av ⁵	4064MB	1599 ⁹⁵	1699 ⁹⁵
Micropolis 3243AV mechanism			
APS ST 4.0 ⁵	4294MB	1899 ⁹⁵	1999 ⁹⁵
Seagate ST 15150N mechanism			
APS MS 9.0 ⁵	8669MB	2999 ⁹⁵	3199 ⁹⁵
Micropolis 1991 mechanism			
APS MS 9.0av ⁵	8669MB	3099 ⁹⁵	3299 ⁹⁵
Micropolis 1991AV mechanism			
APS ST 9.0 ⁵	9090MB	3299 ⁹⁵	3499 ⁹⁵
Seagate ST410800N mechanism			

* External case is special Full Height only
Full Height cases include SCSI Sentry FREE!



Model	Capacity	RAID Stripe	Price
APS ARRAID			

ARRAID S2/5400 ⁵	2GB	Striped	\$1399 ⁹⁵
ARRAID S2/7200 ⁵	2GB	Striped	1599 ⁹⁵
ARRAID S4/7200 ⁵	4GB	Striped	2499 ⁹⁵
ARRAID S8/7200 ⁵	8GB	Striped	3999 ⁹⁵
ARRAID M1/7200 ⁵	1GB	Mirrored	1599 ⁹⁵
ARRAID M2/7200 ⁵	2GB	Mirrored	2499 ⁹⁵



ARRAID Disk Array systems from APS are high performance, easy-to-use disk array storage solutions. ARRAID provides the power, reliability and plug-and-play convenience Macintosh users expect. Available in mirrored or striped configurations up to 16GB, with a 5-year warranty.

ARRAID is RAID Made Easy!

APS Technologies

1- 8 0 0 8 7 4 - 1 4 2 8 APS Technologies 6131 Deramus, Kansas City, MO 64120



20GB & 110MB per minute!

\$2999⁹⁵

APS DLT20

Introducing the APS DLT20!

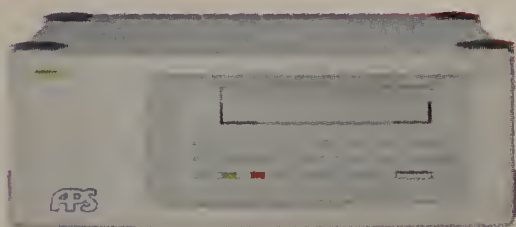
The backup device for those who find that 8mm and DAT just aren't enough. The APS DLT20 is designed to handle large databases, digital video files, prepress applications and other environments where there is an ongoing need to backup very large data files that change frequently or that need to be archived in whole.

- Up to 20GB per tape
- Up to 110MB per minute
- You save time
- You save down time
- You save \$\$\$
- You save your data



APS DLT20

DLT20 Data Cartridge
\$45⁹⁵



\$799⁹⁵
External configuration

APS DAT

Buy the APS DAT at just \$799.95 and you'll get the expanded capability provided by an enhanced speed mechanism and hardware data compression! The APS DAT—now up to 20% faster than other DDS-1 DC drives—packs up to 4GB* of data on a 90M tape! Amazing!

\$999⁹⁵
External configuration

APS HyperDAT

If you need high-speed backup, you need the DDS-2 power of the APS HyperDAT! Back up locally at rates as high as 28MB per minute! Pack up to 8GB* on a single tape! Best of all, your regular DDS and DDS compression tapes can be read by APS HyperDAT too!

APS TAPE DRIVES

Model	Capacity*	Internal	External
APS DLT20 ²	20GB†	—	\$2999 ⁹⁵
APS HyperDAT ¹	8GB on 120m	949 ⁹⁵	999 ⁹⁵
APS DAT ²	4GB on 90m	749 ⁹⁵	799 ⁹⁵

*Actual data compression and tape capacity vary greatly depending on the type of data recorded, other system parameters and environment.
† 2:1 Hardware data compression

All APS DATs Include Retrospect by Dantz

Tape Media	1-4	5-19	20+
60-Meter	\$7 ⁹⁵	\$6 ⁹⁵	\$5 ⁹⁵
90-Meter	9 ⁹⁵	18 ⁹⁵	7 ⁹⁵
120-Meter (DDS-2)	19 ⁹⁵	18 ⁹⁵	17 ⁹⁵
DLT Data cartridge	45 ⁹⁵	—	—
DLT 3PK Data cartridges	129 ⁹⁵	—	—

APS REMOVABLES

Model	Capacity	SR 2000
APS SQ 3270 ²	270MB	\$479 ⁹⁵
APS SQ 5200 ²	200MB††	499 ⁹⁵
APS SQ 5110c ²	44/88MB†	369 ⁹⁵

† Does not format 44MB cartridges

†† Does not format 44MB & 88MB cartridges

All SyQuest drives include 1 FREE cartridge

SyQuest Media	1-4	5-9	10+
SQ-400 (44MB) cartridge	\$44 ⁹⁵	\$43 ⁹⁵	\$41 ⁹⁵
SQ-800 (88MB) cartridge	54 ⁹⁵	53 ⁹⁵	51 ⁹⁵
SQ-2000 (200MB) cartridge	84 ⁹⁵	83 ⁹⁵	81 ⁹⁵
SQ-310 (105MB) cartridge	59 ⁹⁵	58 ⁹⁵	56 ⁹⁵
SQ-327 (270MB) cartridge	64 ⁹⁵	63 ⁹⁵	61 ⁹⁵

Prices listed are for unformatted media

APS MO DRIVES

Model	Internal	SR 2000
APS 230MB MO ¹	—	\$799 ⁹⁵
APS 1.3GB MO ¹	1899 ⁹⁵	1999 ⁹⁵

All MO drives include 1 FREE cartridge

MO Media	1-4	5-9	10+
128MB cartridge —	\$35 ⁹⁵	\$34 ⁹⁵	\$29 ⁹⁵
230MB cartridge —	45 ⁹⁵	44 ⁹⁵	39 ⁹⁵
1.3GB cartridge —	109 ⁹⁵	109 ⁹⁵	104 ⁹⁵

(1024KB/s)

1-5 Denotes length of manufacturer's warranty

APS INTERNATIONAL Global Storage Resource

APS Intl. Sales Line (816) 920-4109

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International
Sales

POWERBOOK DRIVES

Model	Capacity	Internal	LW Pro 630	Companion II
APST 340 ¹	324MB	\$299 ⁹⁵	\$349 ⁹⁵	\$449 ⁹⁵
APS Q 341 ¹	326MB	299 ⁹⁵	349 ⁹⁵	—
APS Q 514 ¹	490MB	399 ⁹⁵	449 ⁹⁵	—
APST 520 ¹	511MB	449 ⁹⁵	499 ⁹⁵	599 ⁹⁵

POWERBOOK STUFF

APS SCSI DOC
w/PowerMerge Lite



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Palm-Sized 25-30 PowerBook SCSI Adapter that includes a docking adapter for PowerBook and termination power indicator. Receive Power-Merge Lite Free with every APS SCSI DOC!



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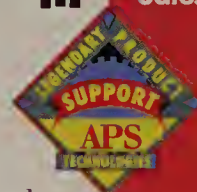
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The Initiate



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36 mo

PowerMac 6100/66, 8-350 w/CD
15" Multiscan Display
Extended Keyboard
SyQuest 270, external

CyberMac 81 Workstation

PowerMac 8100/100AV, 16-1000 CD
20" Multiscan Display
Supermac GX 1152



Lease
\$298
36 mo

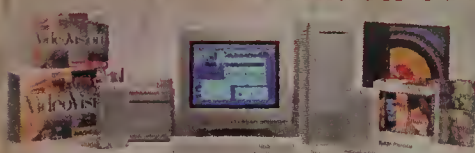
Extended Keyboard
SyQuest 270, external

The Enterprise 7101

PowerMac 7100/80, 16-700 w/CD
17" Multiscan Display
Extended Keyboard
SyQuest 270, external

Lease
\$190
36 mo

Demon Workstation 8110



PowerMac 8100/110, 16-2000 CD
21" Multiscan Display
Supermac GX 1600
VideoVision 2 Pro Pak
w/4.2 GB Array
Premiere 4/VideoFusion
Ext KB, Apple Design Speakers

Lease
\$456
60 mo

* Activation required. Phones vary with rate plan. Phone certificates are transferrable and valid for 6 mos. Allow 2-3 weeks for delivery. Certain restrictions may apply. Void where prohibited by law.

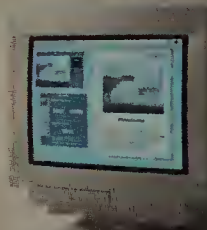
PowerMac

		Lease
6100/66, 8-350	1576	52
6100/66, 8-350 w/CD	1758	58
6100/66AV, 8-350 w/CD	2156	71
6100/66, 16-500 w/DOS	2390	78
7100, 8-500 w/CD	2295	75
7100/80, 8-500	2512	82
7100/80, 8-700 w/CD	2806	92
7100/80AV, 16-700 CD	3317	109
8100, 8-500	2695	88
8100, 16-500 w/CD	3195	105
8100/100, 8-700	3143	103
8100/100, 16-1GB w/CD	3873	127
8100/100AV, 16-1GB CD	4060	133
8100/110, 16-2GB w/CD	5419	178

Quadra 950, 8-0	2672	88
Quadra 630, 4-250	1028	34
Performa 6115CD	2595	86
Performa 630, 8-250 CD	1785	73
Performa 475, 4-160	1095	35

Monitors

		Lease
Apple 20" Multiple Scan	1826	60
Apple 17" Multiple Scan	968	32
Apple 14" AV Clr Display	549	17
Apple 15" Multiple Scan	479	14
Apple 14" Color Plus	295	--
Supermac 21"•TXL	2010	66
Supermac Pressview 21 T	2999	98
Radius IntelliColor/20e	1795	62
Radius PrecisionColor 20v	1399	46



Radius PrecisionColor 17	975	33
RasterOps ClearView 17	836	27
Sony 17SE1	989	32
Sony 20SE1	1895	62
Sony 15" SF	499	15

Video Boards

		Lease
Supermac T-II GX1600	2699	88
Supermac T-II GX1360	1995	63
Supermac GX1152	1895	75
Radius Thunder IV cards	call	--
Radius P'Color Pro 24X	1295	43
Radius LeMans GT	899	39
Radius P'Color 24XP	299	15
Radius VIDEO VISION v2	3350	109

w/Premiere v4 & VideoFusion

WG Servers

		Lease
6150, 8-500 w/CD	2208	72
8150, 8-500 w/AppleShare	4044	133
9150, 8-2000 w/CD	5188	170

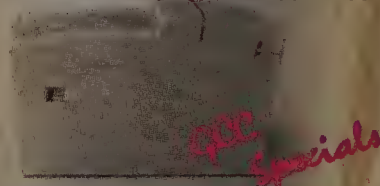


Powerbooks

		Lease
150, 4-120	1349	44
520, 4-160	1795	55
520c, 4-160	2295	75
520c, 12-160 w/modem	2925	95
540c, 4-320	3195	104
540c, 12-500 w/modem	3875	127
280c, 4-320	3150	103
280c, 12-320 w/modem	3800	124

Printers

		Lease
StyleWriter II	295	--
Color StyleWriter 2400	589	18
HP 4MV	2699	87
HP 4MP	1299	42
LaserWriter 16/600	2095	69
LaserWriter 360	1299	39



GCC SelectPress 1200	5449	149
GCC SelectPress 600 Pro	4498	123
GCC SelectPress 600	3595	98
GCC ColorFast II	4299	117

Scanners

		Lease
Agfa StudioScan II	899	29
Agfa Arcus Plus II	2599	85
HP ScanJet IIcx	990	42
UMAX Vista S6	825	36
UMAX Vista S8	999	33
Microtek Scanmaker III	2675	88
Microtek IISP	850	28
Nikon CoolScan	1759	58

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		Lease
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Pinnacle Tahoe 230	999	33
FWB HammerDAT2000	1297	39
FWB HammerDAT5000	1389	45
PLI SyQuest 200c	599	20
Plextor 4Plex CD-ROM	649	21
Radius 4 GB Pro Array	5400	179
1 GB Quantum 1080S	579	19
1.7 GB Micropolis	810	39
2.1 GB Seagate/Quantum	1140	37
2.4 GB Seagate Barracuda	1195	39
4 GB Seagate Barracuda4	1995	60

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55.95	Next Generation Tech Manual
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59.95	Gadget
44.95	Indiana Jones—Fate of Atlantis
59.95	Iron Helix
39.95	The Chessmaster 3000
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9.95	Funny
49.95	Return to Zork
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19.95	The View From Earth
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69.95	Time Almanac
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Hard Drives

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(2 Year Warranty)

Maverick Series

Capacity	Access	RPM	Cache	Int.	Ext.
270 MB	14 ms	3600	128K	170	230
540 MB	14 ms	3600	128K	220	280

(2 Year Warranty)

Lightning & LPS

Capacity	Access	RPM	Cache	Int.	Ext.
270 MB	11 ms	4500	128K	185	265
340 MB	11 ms	4500	128K	179	239
365 MB	11 ms	4500	128K	195	255
535 MB	9.5 ms	4500	512K	240	300
730 MB	11 ms	4500	128K	285	345

(5 Year Warranty)

Empire & Grand Prix

Capacity	Access	RPM	Cache	Int.	Ext.
1080 MB	10ms	5400	512K	579	639
1337 MB	9.5 ms	5400	512K	695	755
2100 MB	9.5 ms	5400	512K	979	1039
4200 MB	8.6 ms	7200	512K	1849	1909

Daytona Powerbook Drives

Capacity	Access	Warranty	Int.	Ext.
256 MB	17ms	1 Year	280	380
340 MB	17ms	1 Year	330	430
514 MB	14ms	1 Year	445	545

MICROPOLIS MICROPOLIS

(5 Year Warranty)

Capacity	Size	Model	Access	RPM	Cache	Int.	Ext.
1.2 GB	3.5"	M4110	Low Profile	8 ms	5400	512K	\$585 \$645
1.7 GB	3.5"	M2217	Low Profile	10 ms	5400	512K	890 950
2.1 GB	3.5"	M4221	Low Profile	8.5 ms	7200	512K	895 955
3.6 GB	5.25"	M1936		11 ms	5400	256K	1220 1320
4.3 GB	3.5"	M3243		8.5 ms	7200	512K	1575 1635
9.0 GB	5.25"	M1991		11 ms	5400	512K	2775 2875

Seagate Seagate Seagate Seagate

Capacity	Size	Model	Access	RPM	Cache	Int.	Ext.
1.0 GB	3.5"	Hawk 1LP	10ms	5400	512K	\$565	\$625
2.1 GB	3.5"	Hawk 2LP	9ms	5400	512K	1059	1119
4.2 GB	3.5"	Hawk 4	9ms	5400	512K	1599	1659
1.0 GB	3.5"	Barracuda 2LP	8ms	7200	1024K	805	865
2.4 GB	3.5"	Barracuda 2LP	8ms	7200	1024K	1105	1165
4.2 GB	3.5"	Barracuda 4	8ms	7200	1024K	1825	1885
9 GB	5.25"	ST 410B00N	11ms	5400	512K	3095	3195

IBM Drives utilize IBM's advanced Magneto-Resistive (MR) disk technology which increases the amount of data stored per disk surface and reduces the number of heads making the IBM series more slim-lined and reliable.

IBM IBM IBM IBM IBM

Capacity	Seek	RPM	Warranty	Int.	Ext.
540 MB	12 ms	4500	2 Year	245	305
720 MB	12 ms	4500	2 Year	295	355
1.0 GB	11 ms	5400	5 Year	595	655
2.0 GB	9 ms	5400	5 Year	1060	1130

Genuine Products by



Capacity	Seek	RPM	Int.	Ext.
88 MB SQ5110C	20ms	3200	300	360
200 MB SQ5200	18 ms	3200	420	480
270 MB SQ3270	13.5ms	3200	420	480

2 Year Warranty on all SyQuest Drives
SyQuest drives come complete with a cartridge (Formatted or Unformatted) and the latest SCSI 4.3 compatible software.



Capacity	Model	Warranty	Price
44 MB	SQ400	5 year	\$41
88 MB	SQ800	5 year	47
105 MB	SQ310	5 year	53
200 MB	SQ2000	5 year	75
270 MB	SQ327	5 year	63

One FREE Cartridge Included with all SyQuest Drives!



Capacity	Access	RPM	Int.	Ext.
1.2 GB C3323	9.5 ms	5400	\$625	\$685
2.4 GB C2490	B.5 ms	6400	1150	1210

Direct to Disk Recording Audio/Visual Hard Drives

MICROPOLIS MICROPOLIS

Capacity	Size	Model	Access	RPM	Cache	Int.	Ext.
1.2 GB	3.5"	M4110AV	10 ms	5400	512K	\$625	\$685
1.7 GB	3.5"	M2217AV	10 ms	5400	512K	945	1005
2.1 GB	3.5"	M4221AV	8.5 ms	7200	512K	1095	1155
3.6 GB	5.25"	M1936AV	11 ms	5400	512K	1265	1365
4.3 GB	3.5"	M3243AV	8.5 ms	7200	512K	1650	1710
9.0 GB	5.25"	M1991AV	11 ms	5400	512K	2875	2935

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A/V
Performance!!!

Seagate Seagate Seagate Seagate

Capacity	Size	Model	Access	RPM	Cache	Int.	Ext.
1.0 GB	3.5"	Barracuda 2LP	8ms	7200	1024K	805	865
2.4 GB	3.5"	Barracuda 2LP	8ms	7200	1024K	1105	1165
4.2 GB	3.5"	Barracuda 4	8ms	7200	1024K	1825	1885
2.4 GB	3.5"	Barracuda 2W	8ms	7200	1024K	1345	1445
4.2 GB	3.5"	Barracuda 4W	8ms	7200	1024K	2485	2615

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The new A/V drives by Quantum with MR technology are specially tuned to maximize your performance by ProDirect!

Capacity	Size	Model	Access	RPM	Cache	Int.	Ext.
1.0 GB	3.5"	XP3107	9 ms	7200	1024K	Call	Call
2.1 GB	3.5"	XP32150	9 ms	7200	1024K	1035	1095
4.3 GB	3.5"	XP34300	12 ms	7200	512K	1815	1875

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(T-Cal) equals

Maximum
A/V Performance!!!

CD Rom Drives

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MultiSpin 3Xp	240ms	500Kb/sec	\$395
MultiSpin 4Xe	220ms	600Kb/sec	\$495

Plextor	Access	Transfer	Price
4PlexQuadSpeed	235ms	600Kb/sec	\$540

CHINON	Access	Transfer	Price
CDX535 Dual Speed	280ms	300Kb/sec	\$235

Scanners & Printers

Nikon	Scantach	Price
Transparency Adapter		\$1220
Coolscan 35mm film scanner		\$535
		\$1450

UMAX	UC630/1260	Price
Vista-S6		675/1240
Powerlook		760
		3250

DeskWriter 560C InkJet Printer	Price
	\$568
DeskWriter 1200C	Price
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LaserJet 4ML Printer	Price
	1027
LaserJet 4MP Printer	Price
	1367
LaserJet 4M Plus Printer	Price
	2120

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ProDirect always suggests that our customers back up their hard drives. In the event of hard drive failure, be assured and back up your data with quality tape backup drives by Hewlett Packard & Exabyte.

NEW!!!
Allows you to mount your DAT on the Desktop! Backing up your data is as easy as drag and drop!!

Capacity	Model	Transfer Rate	Media	Int.	Ext.
2.0 GB	35470	15 MB/min.	4mm	\$835	\$885
3-5 GB	35480	45 MB/min.	4mm	1039	1099
4-10 GB	1533A	60 MB/min.	4mm	1235	1295
20-50 GB	1553A	60 MB/min.	4mm	3195	3295
Auto Tape Loader					
Exabyte					
2-5 GB	8205	263 KB/sec.	8mm	\$1425	\$1495
5-10 GB	8505	500 KB/sec.	8mm	2175	2275
7-14 GB	8505XL	500 KB/sec.	8mm	2250	2310

All tape backup drives include 1 piece of media and Retrospect backup software.

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PLI Power PC Compatible
Quick SCSI F Nubus Card 500
Great for desktop publishing.
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Silicon Express Fast SCSI-2 Call
SCSI 1 & 2 support, transfer rates up to 10.0 MB/sec., supports multiple block sizes, takes advantage of parallel processing capability. Ideal for graphic design, multimedia applications and more!

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Zero Footprint MicroCab	\$75
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2x8x80	4MB 60/70ns	520,520c,540,540c
4x8x80 60/70ns	8MB 60/70ns	4MB,8MB,16MB,32MB
4x8x80 FX	16MB 70ns	140,170,160,165c,180,180c,Duos
16x8x80 Low Profile	32MB 60ns	4MB,6MB,8MB,10MB
16x8x80 FX	VRAM 256K/512K	12MB,14MB,20MB

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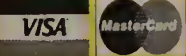
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256MB	17ms	4500	Quantum	\$272
514MB	17ms	4500	Quantum	\$435

Quantum™

#1 HARD DRIVE FOR MAC!



Capacity	Speed	RPM	Buffer	Wty	Model	Internal	External
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540MB	14ms	3600	128K	2yr	MV540S	\$234	\$294
541MB	11ms	4500	128K	2yr	LT540S	\$249	\$309
731MB	11ms	4500	128K	2yr	LT730S	\$265	\$325 BEST BUY!
1080MB	9.5ms	5400	512K	5yr	EMP1080S	\$550	\$599
2140MB	8.6ms	7200	512K	5yr	GP2140S	\$1019	\$1119
2160MB	9.5ms	5400	512K	5yr	EMP2160S	\$909	\$969
4280MB	8.6ms	7200	512K	5yr	GP4280S	\$1829	\$1929

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105MB	\$53	\$50
200MB	\$76	\$71
270MB	\$59	\$56

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88MB	20ms	44, 88MB	SQ5110C	32K	\$285	\$345
105MB	14.5ms	105MB	SQ3105S	64K	\$249	\$309
200MB	18ms	44,88,200MB	SQ5200C	64K	\$419	\$479
270MB	13.5ms	105, 270MB	SQ3270S	128K	\$409	\$469

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4294MB	8ms	7200	512K	5yr	MC3243	\$1479	\$1579
9100MB	12ms	5400	512K	5yr	MC1991	\$2549	\$2649

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2147MB	8ms	7200	512K	5yr	ST32550N	\$1015	\$1115
4290MB	9ms	5400	512K	5yr	ST15230N	\$1455	\$1515
4290MB	8ms	7200	1024K	5yr	ST15150N	\$1699	\$1799
9090MB	11ms	5400	1024K	5yr	ST410800N	\$3049	\$3149

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Toshiba	XM3501	155ms	600KB/sec	256K	\$309	\$379 BEST BUY!

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- MacUser July, 1994

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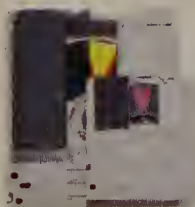
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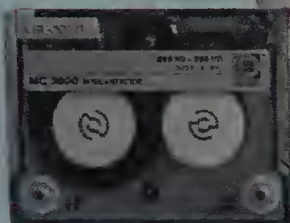
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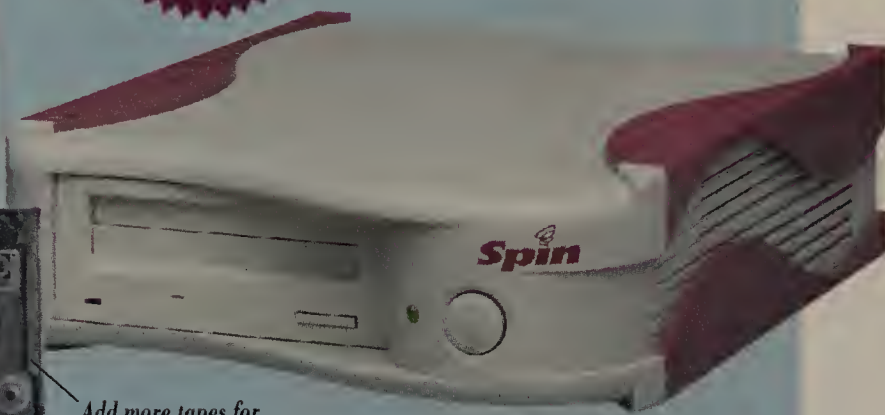
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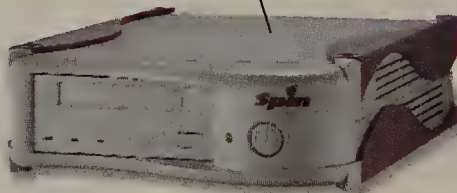


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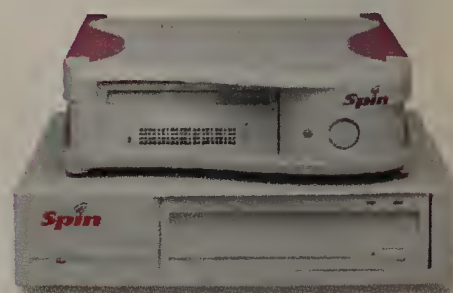
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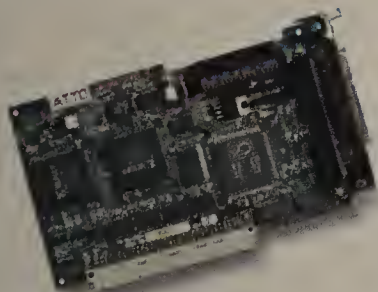
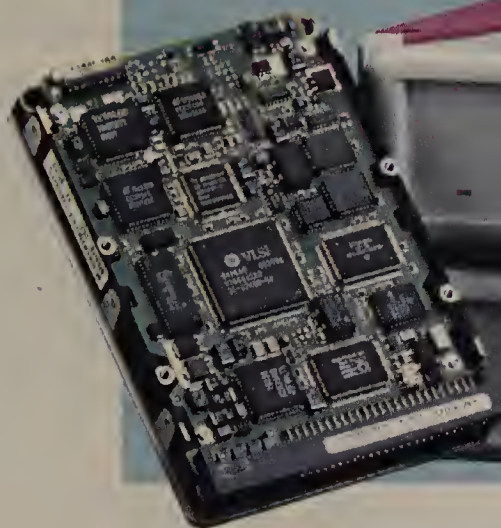
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4 1/2 mice rating
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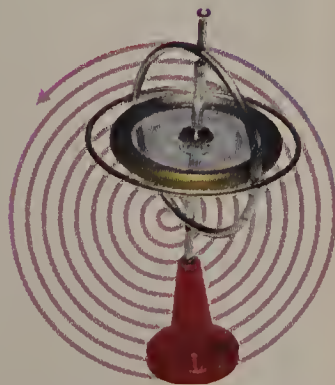
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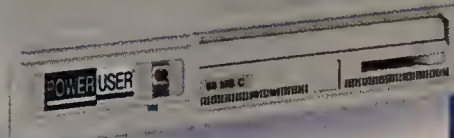
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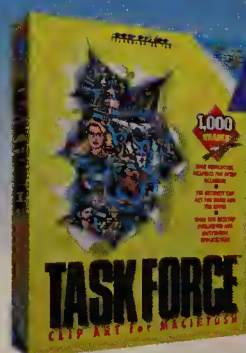
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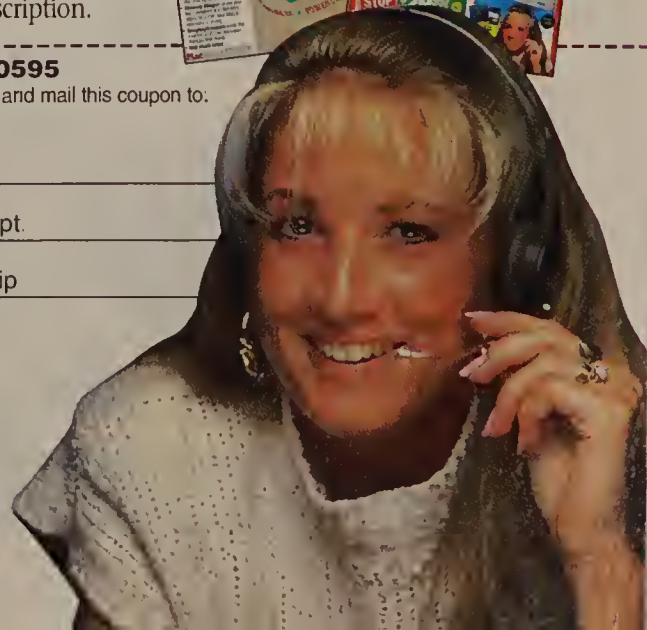
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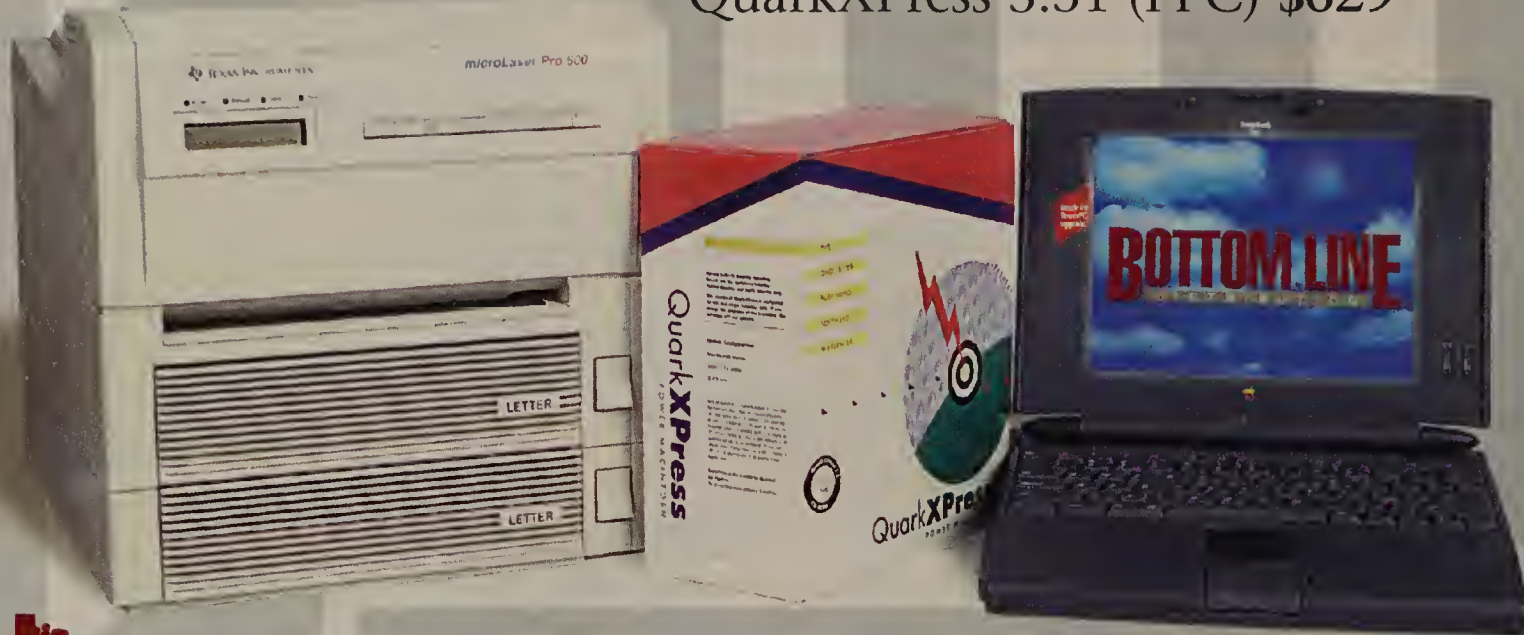
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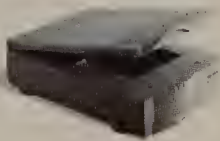
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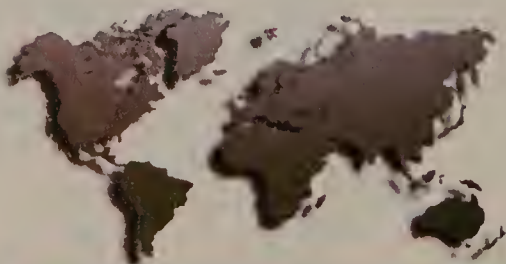
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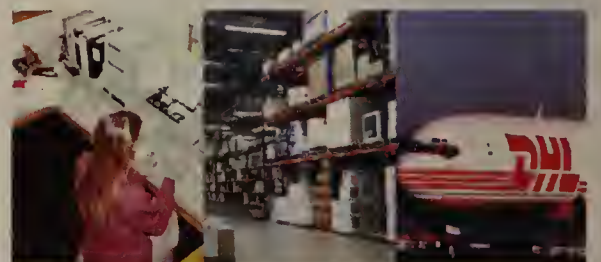


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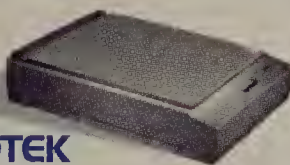
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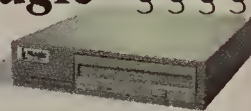
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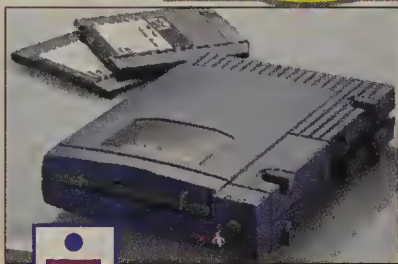
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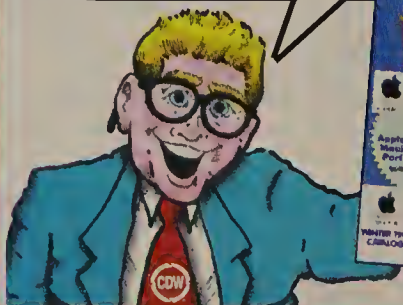
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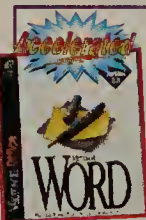
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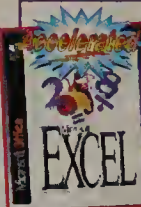
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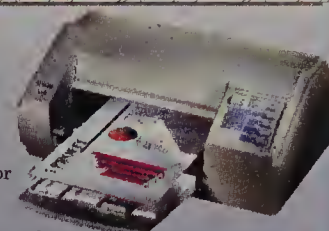
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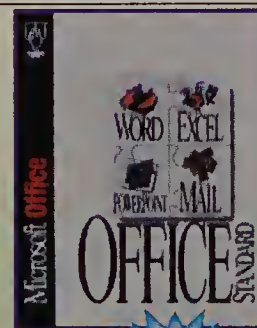
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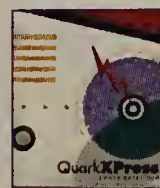


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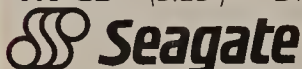
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4-8GB	HP 1533A	DDS-2	\$1375
2-5GB	EXABYTE 8205	8MM	\$1499
5-10GB	EXABYTE 8505	8MM	\$2275

OPTICAL

Capacity	Model #	Seek	External
230MB	FUJITSU 230OP	28MS	\$825
1.3GB	HP C1716	23MS	\$2299
1.3GB	MAXOPTIX TAHITI III	18MS	\$2399

MEDIA

1 GB	\$100	128 MB	\$30
1.3 GB	\$89	230 MB	\$39

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Capacity	Model #	Seek Time	Trans. Rate	Price
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ScanMaker IIHR	1200 dpi flatbed	\$1029
Tamarack 12000C w/trans	1200 dpi flatbed	\$999
Umax PowerLook	1200 dpi flatbed	\$2599
Nikon CoolScan	2700 dpi slide	\$1449
Polaroid SprintScan	2700 dpi slide	\$1859
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Microtek adapter	transparency upgrade	\$519

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Sony SDT-4000	8GB	3.5"HH	\$935	\$985
Sony SDT-5000	5-16GB	3.5"HH	\$1025	\$1075
Exabyte 8200	2GB	5.25"FH	\$1275	\$1350
Exabyte 8500	5GB	5.25"FH	\$2175	\$2250
Exabyte 8205	2-5GB	5.25"HH	\$1585	\$1660
Exabyte 8505	5-10GB	5.25"HH	\$2255	\$2330

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SyQuest 88c /650MB optical drive	\$1299
SyQuest 88c /NEC 3X CD ROM /540MB HD	\$999
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Sony 1.3GB	1.3GB	25ms	\$1999	\$2049
MaxOptix-Tahiti II	1.0GB	25ms	\$1899	\$1949
MaxOptix-Tahiti III	1.3GB	25ms	\$2195	\$2245
PMO-1.3GB	1.3GB	19ms	\$2379	\$2429

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MODEL	CAPACITY	SEEK	MACKIT	dsc Turbo
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Sony P-301	128MB	35ms	\$779	\$829
Panasonic 128	128MB	35ms	\$679	\$729
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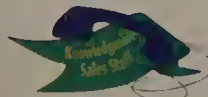
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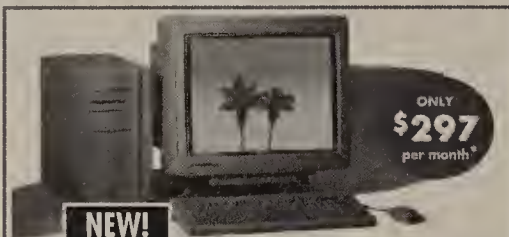


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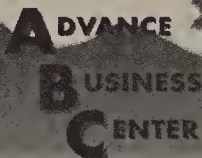
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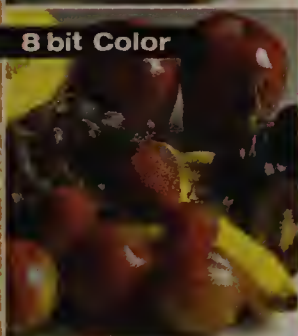


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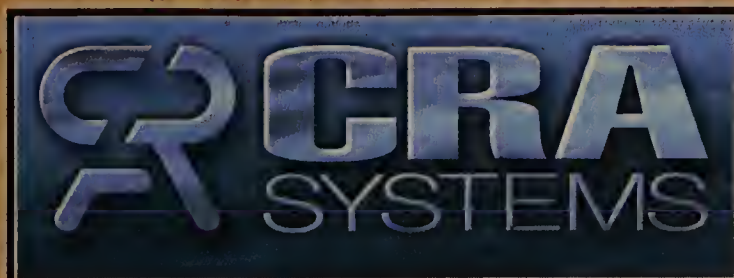
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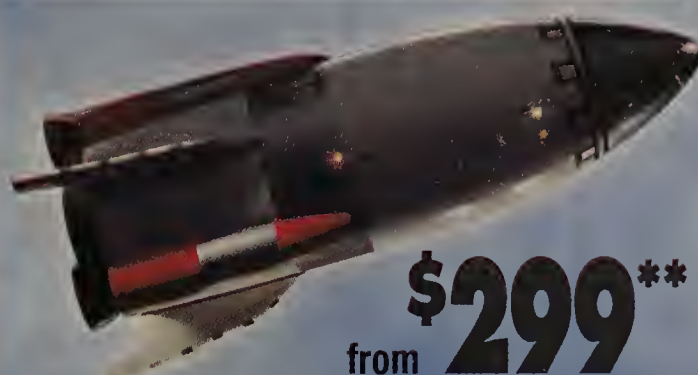
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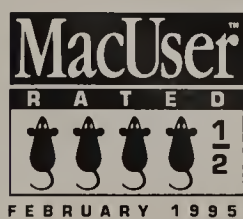
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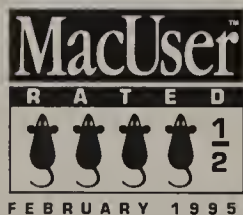
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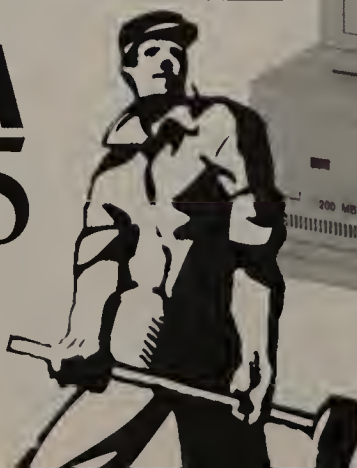
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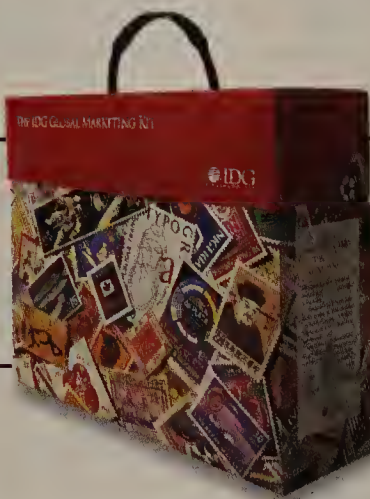
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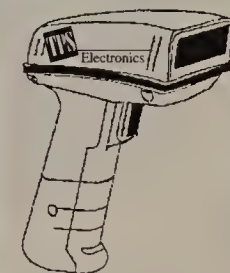
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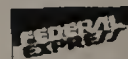
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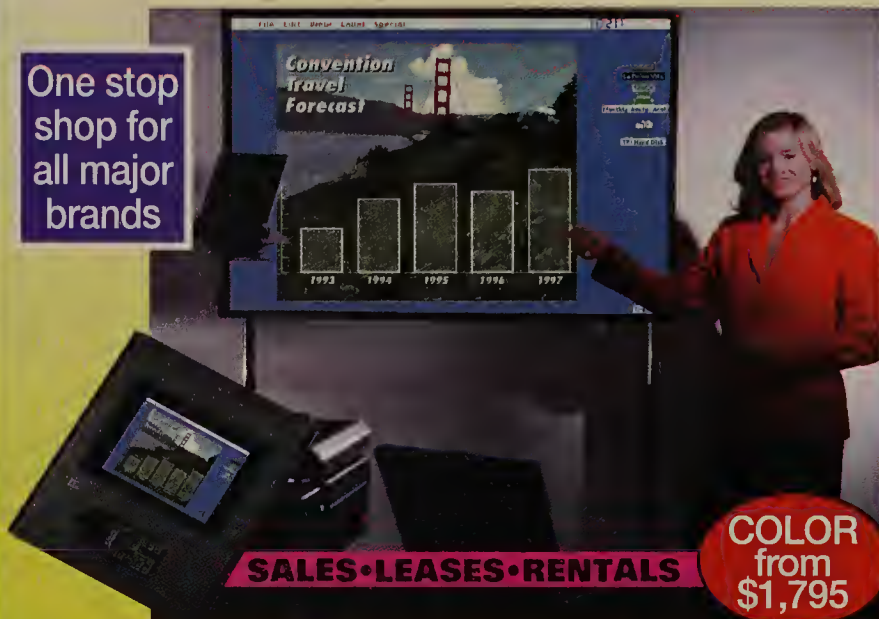
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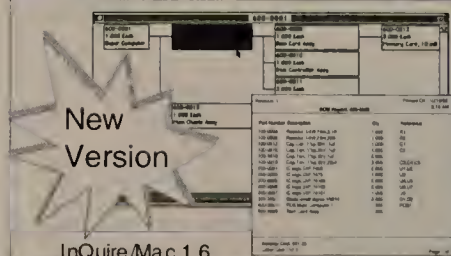
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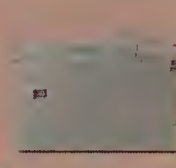
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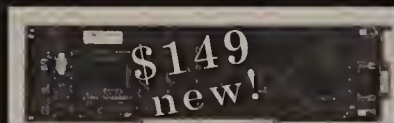
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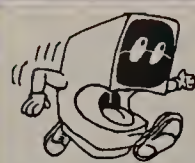
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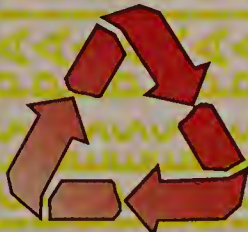
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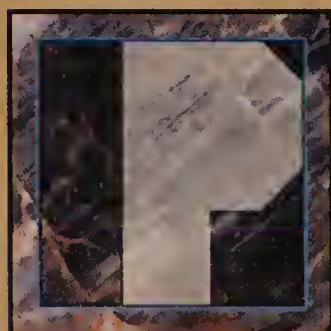
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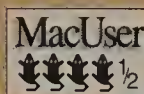
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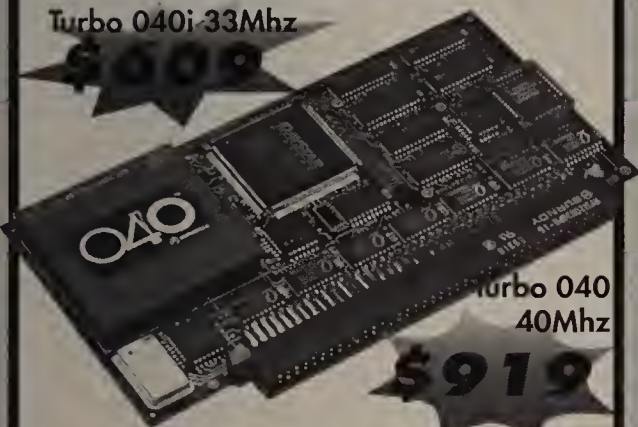


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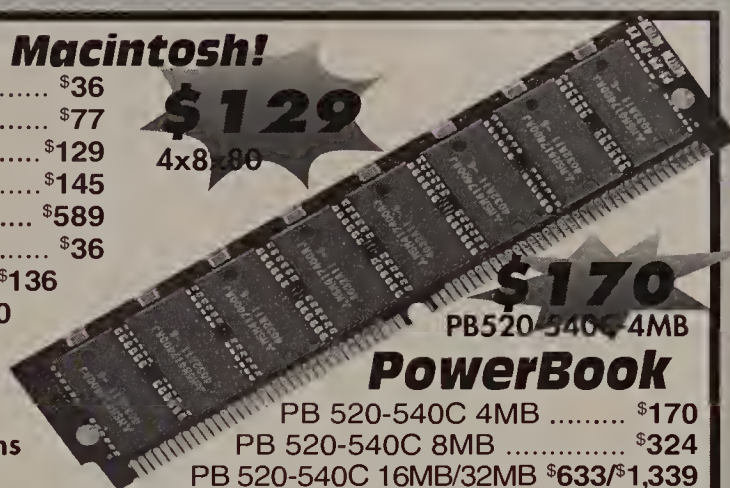
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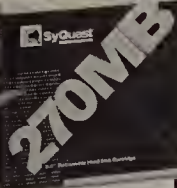
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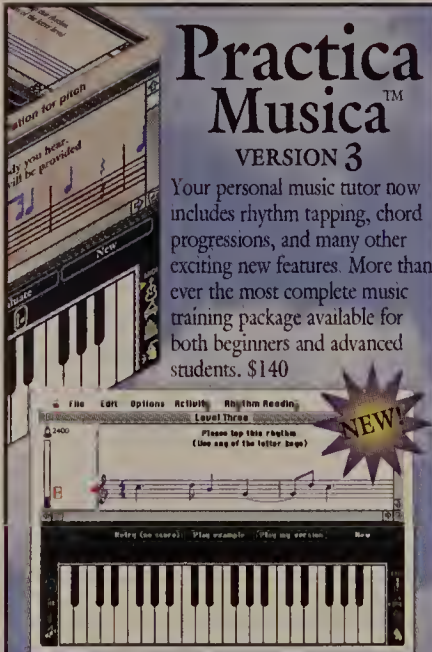
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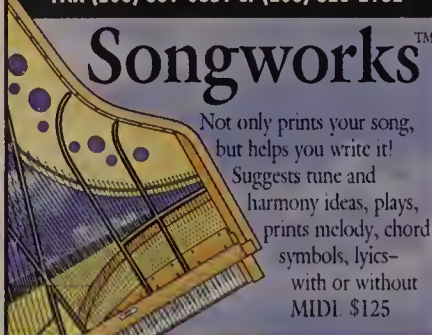
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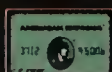
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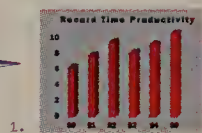
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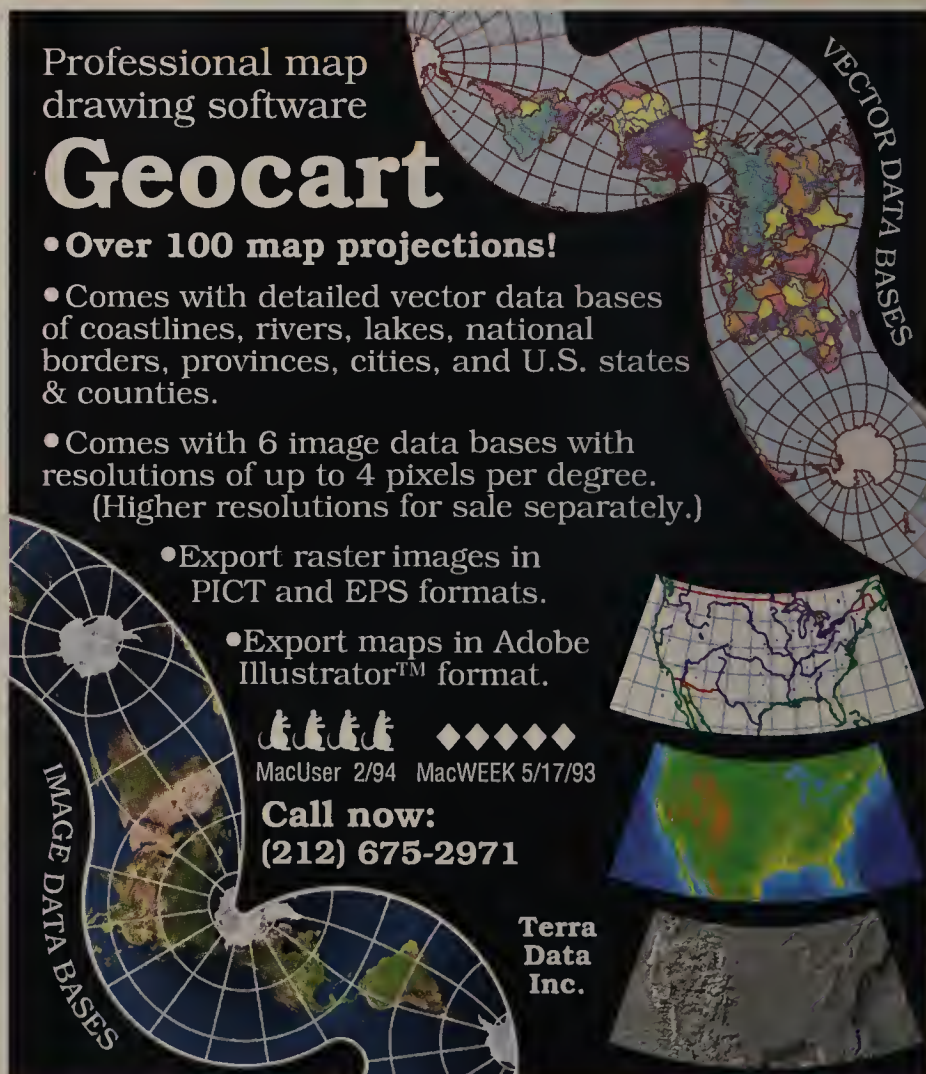
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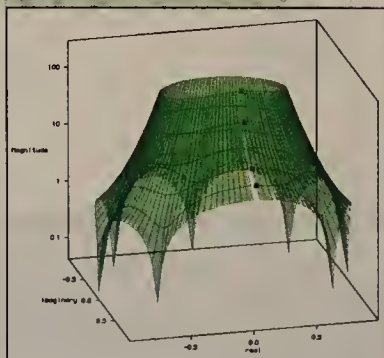
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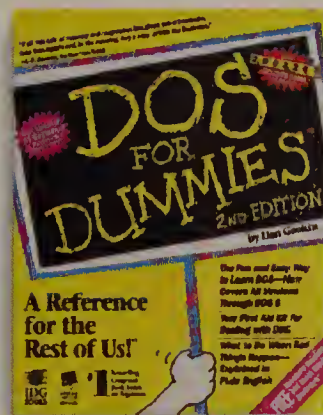
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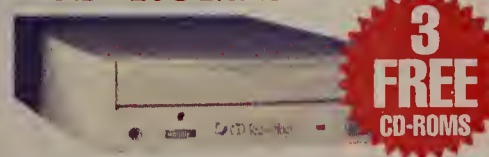
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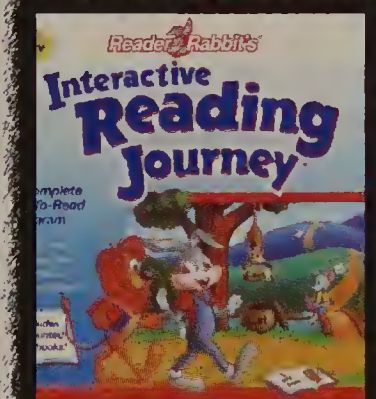
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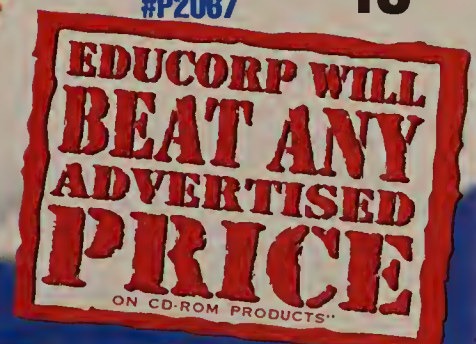
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WISE GUY

BY GUY KAWASAKI

The Mac Attack Test

Is Macintosh taking up too much of your life?

NO ONE IS MORE FERVENT about a cause than the newly converted. Thousands of people got Performas and other Macs for Christmas a few months ago, and by now they are entirely immersed in Macintosh lore, lingo, and lust. This column is intended for new owners of Macintoshes. It provides a way for them to determine if Macintosh is taking over their lives. (The idea for this column came from a column by Joe Mullich in *American Way* magazine.)

Give yourself one point for each item that describes you. If you score more than 20 points, you qualify.

Companies and Personalities

1. When you hear the name *Robin Williams*, you think "goddess of desktop publishing" instead of "comic genius."

2. You hate Bill Gates, but you're not sure who he is. You despise Windows even though you've never used it. You're sad that Microsoft is buying Intuit, but you don't know why.

3. You try to follow the career of John Sculley since he left Apple, and you think Apple needs to get Steve Jobs back. But, as with Bill Gates, you're not sure who they are.

4. You think you know how to run Apple better than anyone who works at Apple. And you're only 16 years old.

5. You refuse to do business with any company that uses dumb quotes in their ads. The first thing you do when you get a word processing file from someone is search for double spaces.

Using Macintosh

1. Your dinner party guests end up discussing the pros and cons of paragraph- and selection-oriented style sheets. You decide that you'd better start using style sheets since you've been debating their design characteristics.

2. Your collection of software CDs is overtaking your music CDs. And you cashed in your financial CDs to buy your kids a Macintosh, justifying it as "a better investment than 5 percent interest."

3. You lust for a 600-dpi printer instead of a Donna Karan suit.

4. You're more concerned about setting up a World Wide Web page about your company than returning your customers' phone calls.

5. You have three times as many PowerBook carrying cases as you have PowerBooks.

6. When your spouse tells you she wants to eat at someplace new, you tell her to use the Chooser.

7. You've started referring to your morning shower as "zapping parameter RAM." When you have too much to do, you tell people you feel "fragmented." When your spouse had morning sickness, you asked her if she was having an "INIT conflict."



8. You've convinced yourself that you need a 28.8-Kbps modem, but you aren't a member of an online service or bulletin board.

9. Every once in a while you remove all your pens, pencils, rulers, books, letters, and magazines from your desk and then put them back again because you heard that you're supposed to rebuild your desktop.

10. You tap twice on the door to open the refrigerator late at night. When it doesn't open, you reach behind it to find the restart button.

Miscellaneous

1. You saw *Forrest Gump* three times because of the reference to Apple Computer. The second time, you were still the only person who got the joke. The third time, you stood up in the theater and explained it.

2. Your toddler's first words were "You've got mail!" You thought this was way cooler than "Mama" or "Dada."

3. You asked your pediatrician if it's possible for children to get carpal tunnel syndrome.

4. You found that watching news reports about Intel's botched handling of the Pentium debacle was more amusing than "Late Night with David Letterman."

5. When your manager suggests that you network more with other employees, you point out that you would like to, but they don't have Ethernet cards.

6. You don't know where you put your receipts for filling out your income tax returns, but you know how to play through all four ages of *Myst*.

Extra Credit

1. You want a text file of this column so that you can send it to online friends whom you've never met.

2. You read *Macworld* from back to front.


Test Results

Feeling convicted? Send me an E-mail and confess your sins. I'll send you the text of this column. If I get enough E-mail, in a future column I'll document the 12-step method for kicking the Macintosh habit. **m**

GUY KAWASAKI's views are his own and only sporadically represent those of *Macworld*. He is president of Fog City Software. He has investments in Bit Jugglers, Global Village Communication, Bookmaker Corporation, and others. He can be reached at kawasaki@radiomail.net.

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NEC

Not just a zipper. A self-repairing zipper.



If anything obeys Murphy's Law it's a zipper. They always seem to go wrong at the worst possible time.

The good news is that every zipper on every NoteBook Traveler carrying case is self-repairing. That means that if it goes off track, it's easier to get back on track. And because the zipper is flexible, it can actually realign itself.



Of course, attached to the zipper is the rest of our strong and sturdy case.

Features include reinforced stitching for added security, closed-cell foam padding for greater shock absorbency, PVC lining for maximum protection against puncture damage.

Each case comes with the unique Kensington Satisfaction Guarantee, which includes a lifetime warranty and a 90-day no-risk trial.

Choose from six different sizes and styles, each featuring a variety of pockets and compartments. For more information, call 800-535-4242. Outside US and Canada, 415-572-2700. For information by fax, call and request document 613.



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